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[THE first lecture was devoted to an outline of the treatment of chest wounds from the beginning of the 14th century—when the science was raised by Theodoric, the Italian, and Henri de Mondéville from the obscurity which had surrounded it since Roman times—to 1914. The lecturer referred to the "Grande Chirurgie" published by Guy de Chauliac in 1363; to the decline of Western European learning, including medical and surgical knowledge, during the Hundred Years' War; to the appearance of gunshot wounds after the introduction of the arquebus in the 15th century; and to the renascence of surgery in the 16th century under Ambroise Paré, Gale Wurtz, and Peter Lowe. Coming to the 18th century, the work of John Hunter was discussed and linked up with that of Guthrie and Baron Larrey during the Napoleonic War. Mention of the Crimean campaign, the American Civil War, and the Franco-German War, led on to the "antiseptic era," when the work of Pasteur and Lister, and substitution of the pointed bullet for the leaden ball, rendered surgical conditions much more favourable in the Boer, Spanish-American, and Manchurian wars. It was pointed out that in earlier times improvements noted in one century were often forgotten in the next; that treatment during two periods—the 14th century and the beginning of the 19th—was exceptionally good; and that in the latter particularly, when knowledge of bacteriology and anæsthetics was still non-existent, a remarkable state of efficiency was nevertheless attained to by the medical services of the British and French armies during the closing stage of the Peninsular War.]

LECTURE II.*—TREATMENT OF WOUNDS OF THE THORAX DURING THE WAR OF 1914–19.

The treatment of wounds of the chest with which we started at the beginning of the recent war, and which gradually evolved, may be taken, in a measure, as the effect on us of the experiences of our predecessors. The most recent war of any magnitude which affected British military surgery had been the South African War. We saw how in that campaign the mortality from chest wounds was the lowest on record and that owing to the character of the weapon used—namely, the high-velocity low-calibre rifle—the wounds were, on the whole, not very severe, and commonly did not require active surgical treatment. At the commencement of the late war, therefore, surgeons began with the assumption that the wounds would be more or less of the same character, and that the best treatment for chest wounds would be to leave them alone unless an empyema should form, in which case a drainage operation would be performed. This belief that operative measures were unnecessary is probably the main reason for the lack of surgical assistance provided for men suffering from chest wounds; for a long time, however, the fear persisted that handling a wounded lung might re-start bleeding, and that a wide opening of the chest and formation of a pneumothorax might cause death.

In addition to all these reasons, military exigencies in the early days of the war would not allow of anything like active surgery being performed in close proximity to the front line. The wounded men had perforce to be evacuated to hospitals at the base, where they often arrived too late for anything but conservative treatment. Acting on the assumption that active surgical treatment would be harmful, rather than beneficial, a statement of methods of procedure advised was drawn up for the use of medical officers and published in 1915 in the official Memorandum on the Treatment of Injuries in War.

For purposes of comparison with the treatment adopted in previous wars, the following passages from this Memorandum may be quoted as a summary of the treatment:—

"No doubt many men shot through the chest die in a few minutes, but of those who live long enough to reach a field ambulance or a clearing station the great majority recover. . . . The most important treatment of all is absolute rest in the recumbent or semi-recumbent position. . . . If the opening in the chest be large, so that air passes in and out during respiration, the skin around should be painted with iodine, and the opening of the wound firmly closed with antiseptic gauze covered by strapping. . . . A third of a grain of morphia should be given subcutaneously as soon as possible. . . . The presence of hæmothorax is rather to be taken as an indication for non-interference . . . it is to be accepted that tapping a hæmothorax is never to be practised in the early days after a wound of the lung."

For empyema resection of a portion of rib and drainage of the pleural cavity were advised. It was considered best that missiles retained in the chest should not be removed, unless they lay loose within the pleura and gave rise to pain and discomfort.

UNFORESEEN SEVERITY AND INFECTION OF WOUNDS.

Unfortunately the hopes of a humane war engendered by the experiences of the South African campaign were not realised. None of those who witnessed the arrival in this country of the first convoys of wounded will forget the dismay and consternation which accompanied the realisation that the wounds were severe and lacerated and almost all suppurating. Later, as the war of movement was replaced by trench warfare, wounds from shells, bomb, and trench mortar, and all the inventions of modern warfare became common, with the result that surgeons had entirely to re-cast their ideas of treatment, and the whole character of medical administration had to be remodelled.

THE MORTALITY OF CHEST WOUNDS.

One of the hardest things to arrive at is the actual mortality of chest wounds, yet both from the administrative and surgical aspect it is very important to understand the problem to be faced, which is only now being arrived at. The fatal cases may be considered under three headings as occurring:—

(1) On the field of battle; (2) in the forward medical units; (3) in the base medical units.

Deaths on the Battle-field.—There can be little doubt that the mortality of chest wounds on the battle-field was very high, although at first sight it was not expected. Medical officers working in field ambulances and casualty clearing stations saw how good was the recovery of a large proportion of the men who had been shot through the lungs and they naturally inclined to the belief that in most instances it was not a very serious matter to be hit in the chest. This view, however, neglected a very high mortality in the field. No figures on this point were collected in the British service. On the German side, Sauerbruch gives records of 300 dead examined on the field, and states that 112 of them (or 37 per cent.), were wounded in the chest. A very similar figure, 29 per cent., was recorded by Löffler for 469 dead on the battle-field in the Danish War of 1864, and in the New Zealand War of 1863 there was a 50 per cent. mortality. It is therefore probable that not less than one-third of those killed in the field had been shot in the chest. When one considers that the chest, roughly, is one-third of the target offered, it is probable that the figure given is approximately correct.

* Lecture III. will appear in the next issue of THE LANCET.

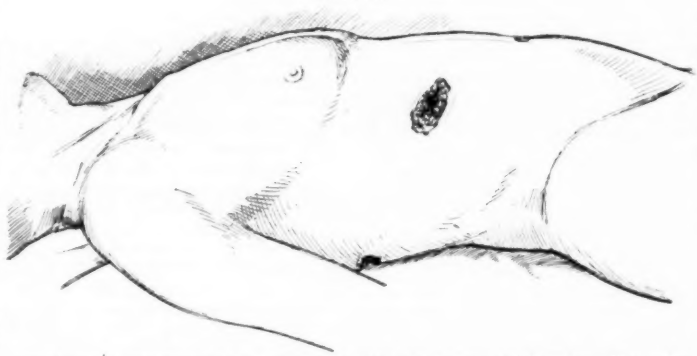
Deaths in Forward Medical Formations.—The mortality rate among the wounded who survived to reach medical units is now pretty accurately known. In the field ambulances it amounted to 7 per cent. and in the casualty clearing stations to 15·9 per cent.

Deaths at the Base.—The figures at the base hospitals are still more accurate. The figures remained pretty constantly at 6 per cent. It is therefore clear that of the men hit in the chest and who survived the battle-field about 30 per cent. died subsequently as the result of their wounds. These figures make one wonder whether the question of the provision of some form of protective armour for the chest should not be considered.

It is evident from what has been written that the mortality from chest wounds in the last war was considerable, and that an effort to reduce the mortality and invalidism of men surviving the field of battle was highly desirable. The problem which presented itself to the surgeon was, firstly, to investigate the morbid anatomy of chest wounds and to find out the causes of death or prolonged invalidism, and, secondly, to study the means of cure.

The opportunity for work of this sort did not present itself until the latter end of 1916, when the fighting on the Somme was dying down and surgeons were no longer delayed with a mass of urgent cases and had sufficient leisure to think and investigate. By this time also vast improvements in the medical services had taken place; hospitals well equipped with good nursing sisters, excellent operating theatres, and the best of instruments had been established close to the front line, so that the wounded were received a few hours after injury and—what was equally important—could be retained sufficiently long to allow proper investigation and observation. There were also facilities for making post-mortem examinations, and good physicians, pathologists, and radiologists were ready and willing to coöperate. In addition the heads of the medical services were eager to encourage and afford every facility for any investigation likely to be of service to the wounded men.

FIG. 1.



Drawing of a perforating shell wound in the right lower costal region. The entry wound behind was slightly smaller than that of the exit in front, but both were large and lacerated. Operation performed 12 hours after the wound.

PATHOLOGY OF CHEST WOUNDS.

It is not possible in these lectures to do more than point out the important aspects of the morbid anatomy of chest wounds; the latter have been described in greater detail in the official Medical History of the War. The wounds inflicted could broadly be divided into three classes: (1) those caused by rifle or machine-gun bullets; (2) shrapnel balls; and (3) portions of shell, bomb, or grenade. The proportion of each class of wound varied with the type of action. In open moving actions wounds by rifle bullets preponderated; in trench warfare the number of those caused by fragments of shell was much greater. Wounds due to shrapnel balls were few, and in the late phases of the war almost disappeared.

Wounds due to rifle bullets commonly perforated the chest and passed out, often drilling a small hole and doing comparatively little damage. These proved the most favourable class and are comparable to the wounds observed in the South African War. Wounds due to fragments of shell (Fig. 1) were the least favourable, for the jagged fragments made large holes, splintered bones, lacerated tissues, and were prone to carry with them fragments of dirty clothing which provoked sepsis. It was soon found that the causes of death in casualty clearing stations could be divided roughly into two classes—those occurring within the first 36 hours after injury, and those occurring later.

The casualties occurring early were almost entirely due to the severity of the injury, combined with shock and loss of blood; and those occurring later—including those in base hospitals—were almost entirely due to sepsis of the pleural cavity or of the contained viscera. Further, the cause of prolonged invalidism following chest wounds was due almost entirely to infection of the pleural cavity and its sequelæ. (See Figs. 2, 3, 4, Coloured Plates.) Thus the problem which confronted the surgeon in dealing with chest wounds was the same as that of all the other wounds—namely, the immediate saving of life from shock and hæmorrhage and the prevention of sepsis.

CHANNELS OF INFECTION.

Granted that the chief danger to a man who had survived the first severity of the wound was infection, it became necessary to see how organisms reached the chest cavity. There were two main routes: (1) a direct introduction by the missile or by portions of clothing or equipment carried in by it, and (2) through the wound in the chest wall. A wound which opens directly into the pleural cavity, and through which air is constantly sucked, always leads to infection, and unless dealt with is often fatal. Further, unless adequate treatment is given to a wound even of moderate dimensions, through which air is not being sucked, it may suppurate in the course of a few days; and if the thoracic cavity is not sealed off organisms gain entrance to the pleural cavity, where they find the blood a convenient medium for growth. This accounts for many cases which exhibit septic changes only after an interval of five or six days. The principle, therefore, to be aimed at is early mechanical cleansing of the wound (both of the chest wall and of the injured viscera);

DESCRIPTION OF COLOURED PLATES.

FIG. 2.—Posterior view of a gunshot wound of the lung with hæmorrhagic extravasation and a wound in its lower lobe caused by indriven rib fragments, one of which (indicated by a dotted line) remains in the lung. The upper lobe is bruised and on its surface is a large subpleural bleb of air that has escaped from the torn pulmonary tissue. From a patient who died six hours after a non-penetrating dorsal wound of the chest by a piece of shell which passed tangentially from the right tenth rib behind to escape over the angle of the left scapula.

FIG. 3.—Thoracotomy performed 14 hours after a gunshot wound had been inflicted. The picture shows the chest widely opened and the lung pulled out by means of Duval's forceps. The lung is collapsed, wounded, and infiltrated with blood.

FIG. 4.—Perforating shell wound of the chest in the right lower costal region (from the same case as Fig. 1). Picture showing the injury when the splintered ribs had been removed after an incision joining the entry and exit wounds. The diaphragm has a tear 6 inches long and the liver shows radiating fissures with extensive laceration. The diaphragm was sutured and the chest closed. The patient died from shock 20 hours later.

GUNSHOT WOUNDS OF THE CHEST AND THEIR TREATMENT.

Fig. 2. The Wounded Lung.

GUNSHOT WOUNDS OF THE CHEST AND THEIR TREATMENT.

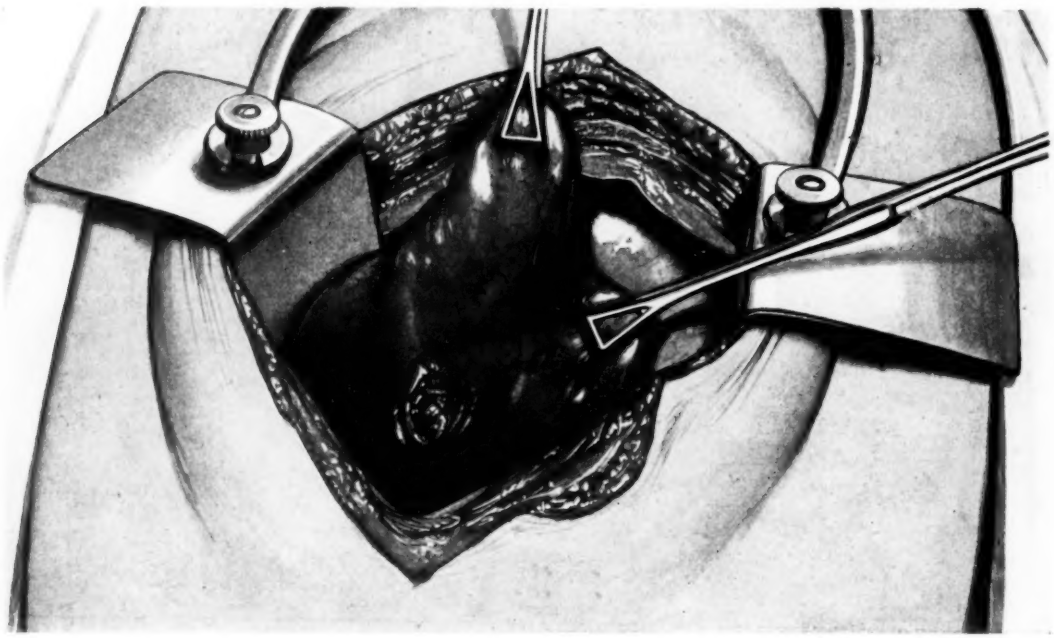


Fig. 3. The Chest widely opened.

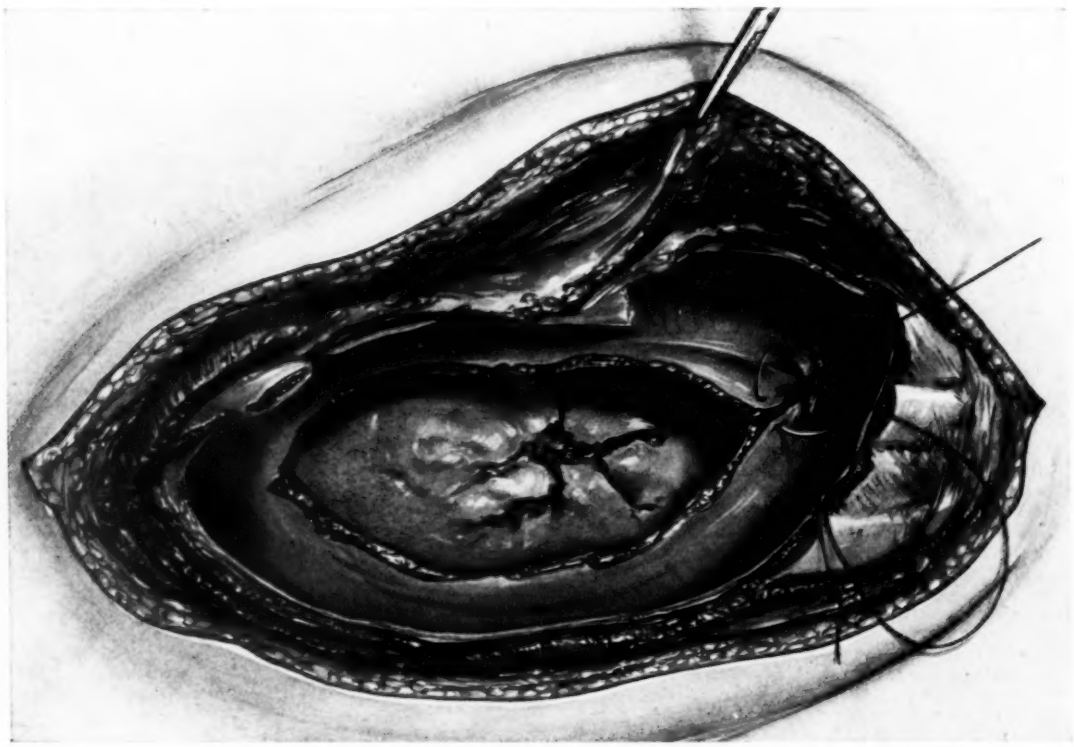
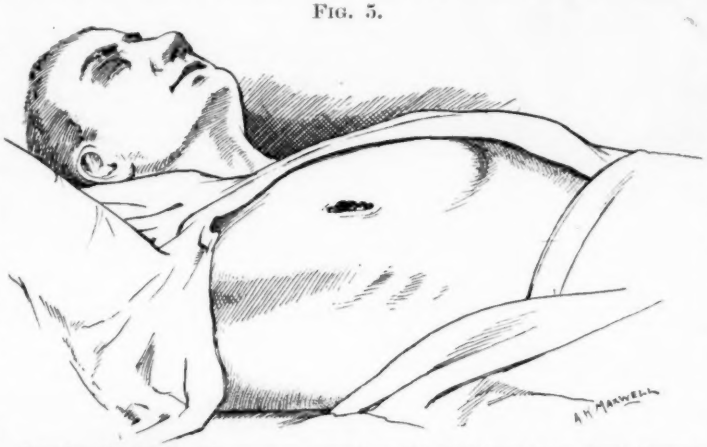


Fig. 4. Repair of the Diaphragm.

evacuation of all foreign bodies and of effused blood from the pleural cavity; repair or suture of the damaged lung, and closure of the chest cavity by suture.

It has been demonstrated with absolute certitude that the correct treatment of a contaminated wound, in order to prevent infection and suppuration in that wound, is a mechanical cleansing carried out a few hours after the injury before organisms have had time to grow and infect. This is attained by excision of the damaged and devitalised tissues, and removal of all foreign bodies, followed by early closure of the wound either by primary or delayed primary suture. The establishment of this principle is a far-reaching truth and is the greatest contribution made to military surgery in the late war. It results from the knowledge of anatomy, physiology, and pathology and is applicable equally to wounds of the extremities, head, abdomen, or chest. Many of our predecessors, especially in the Napoleonic wars, did great work, but the knowledge of bacteriology was denied them, and so they were unable to attain the results which were achieved by surgeons in the late war. The application of this great truth to wounds of the chest was not arrived at in one step; it was only little by little that we groped towards the light, and when we recall our early efforts to cure grossly suppurating wounds with highly-coloured strong antiseptics, and how we stated that surgery was put back to the pre-Listerine period, it seems as if we had been extraordinarily short-sighted and stupid. It is customary to exhibit a mild amusement at the quaint practices of our forefathers, but did not we forget much more than they forgot?

FIG. 5.



Drawing of patient with an open wound on the right side of the chest through which air was being sucked in and out. The series of drawings (Figs. 5–8) shows stages in the thoracotomy performed on this patient 15 hours after infliction of his wound.

OBSTACLES TO CHEST SURGERY.

As has been mentioned before, surgeons attempting chest surgery were at first troubled by two apparently large obstacles. The first was the dread of opening the chest, under a general anæsthetic, lest the resulting pneumothorax should cause a fatal respiratory failure; and the second was the fear lest manipulation of a recently-wounded lung might start uncontrollable bleeding. If the principle of mechanical cleansing of the wound was to be carried out, then it was necessary that a wide opening in the chest should be made so that the thoracic viscera could be brought into view.

Anæsthetics.—Prior to the war, the inclination of surgeons tended towards the use of some form of pressure chamber or intratracheal insufflation apparatus when it became necessary to open the pleural cavity. It was evident that such an apparatus was impracticable in the field and a very few trials with the ordinary anæsthetics proved at once that, at any rate under conditions then prevailing, a patient could be anæsthetised and one pleural cavity could be opened widely without any grave danger. As a matter of fact, patients with thoracic wounds bore operation well and took an anæsthetic satisfactorily, and we found it unnecessary to consider a pressure chamber. My own predilection was for the use of chloroform, either by itself or combined with oxygen, given through a Shipway's apparatus. The French used ether; the Americans, when they came in, used gas and oxygen, and many British surgeons employed local anæsthetics. It is therefore evident that the anæsthetic problem is not a difficult one. One of the bogies which hindered progress was therefore killed.

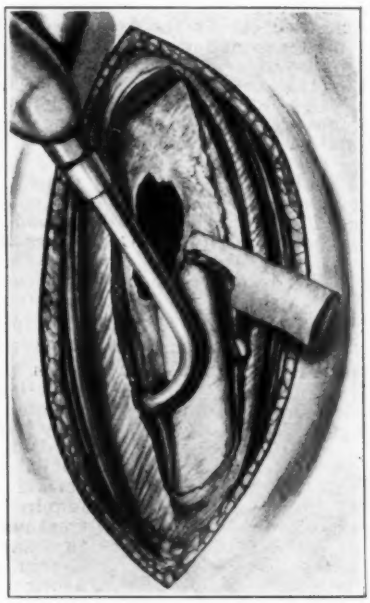
Manipulation of Wounded Lungs.—The other great fear—that handling of a wounded lung might re-start a serious bleeding—also vanished, for it was found that such manipulation was easy, was not attended by a serious fall of blood pressure, and did not cause bleeding. Once these difficulties were removed the way to advance was clear, and it remained only to decide which were the correct cases to operate on, and to devise the best routes of access to the thoracic cavity and the necessary technique.

SELECTION OF CASES FOR OPERATION.

It appeared obvious that a certain proportion of patients would get well without any operation, and equally obvious that a certain number required surgical treatment, either to save their lives or to prevent a long and severe illness; there was also a large intermediate class in which opinion might be divided. The sort of case which appeared most to require assistance was the man with a large open wound with fracture of ribs and a retained missile. Such cases almost invariably did badly on account of sepsis. Many died, or if they did not die, developed an empyema which seriously affected their convalescence.

It was on such a case that I personally did my first big thoracic operation during the war. It was in the latter end of 1916, while the work was very much in the experimental stage, and curiously the subject of the experiment was a young Australian doctor, who was admitted with a large open wound over the lower part of the thorax and a retained missile. After consultation with the excellent and helpful physician who was associated with the investigation, operation was decided on. The patient was anæsthetised with chloroform, the wound opened up, about four inches of the broken rib excised, and the pleural cavity opened widely by means of a rib-spreader. In the cavity of the pleura was found a shrapnel ball, a bit of rib, and a large piece of khaki tunic. These were removed, the jagged ends of rib cut cleanly off, and the pleural cavity cleared of blood; then the chest was closed in layers, pleura to pleura, muscle to muscle, and skin to skin. To our great joy the patient did well; the wound healed by first intention and remained healed, the lung rapidly expanded, and the pneumothorax disappeared. There was no doubt that that man, if nothing had been done, would, even if he had lived, have had an empyema which would have invalided him for a long period and very likely have given him a lifelong disability. As a matter of fact, his convalescence was short, and he soon regained his unit, we saw him in 1917 and again in 1918 and were able to assure ourselves by his record of service and by clinical and X ray

FIG. 6.



The wound of the soft parts has been excised down to the broken rib, which is being lifted subperiosteally by Doyen's elevator; the wound through the parietal pleura is exposed.

examination that his cure was sound and permanent. This successful case made a deep impression on our minds and revealed the possibilities of thoracic surgery in the field which, though suspected, were not proved.

It is unnecessary to detail all the steps which led up to the practice which was in force in the British armies on the Western Front at the termination of hostilities. The results achieved were the outcome of the earnest work of many surgeons, who received the greatest assistance from physicians, bacteriologists, and radiologists; the value of the team-work, as witnessed in the British Expeditionary force, has made a big impression on our profession.

Simultaneously with the progress made in the British medical services, the most excellent work was being done by the French, and the name of that brilliant surgeon, Pierre Duval, whom we esteem as an Honorary Fellow of our College of Surgeons, must ever be associated with thoracic military surgery.

POSITION OF THE TREATMENT OF CHEST WOUNDS AT THE END OF THE WAR.

In order to demonstrate the changes which had been made in the treatment of chest wounds during the war, it may now be apposite to quote a summary which was published in the last "Manual of Injuries and Diseases of War," printed in 1918, as a guide to medical officers.

"I. Cases in which primary operation is indicated:—(1) A ragged wound of the soft parts; (2) compound fracture of ribs; (3) bleeding from the parietal wound and intercostal artery; (4) pain; (5) an open wound of the thorax through which air is pumped in and out of the pleural cavity; (6) retention of a large foreign body in an accessible position.

II. Cases which do not require primary operation:—(1) Small clean wounds, including through-and-through bullet wounds, without evidence of serious intrathoracic injury other than hæmothorax; (2) cases in which a missile is retained, which is only of a small size; (3) cases in which a missile, though of large size, is in a position difficult of access; (4) cases of uninfected hæmothorax.

III. Cases in which primary operation is contra-indicated:—(1) Shock and collapse, such as would be contra-indications for any surgical procedure; (2) Collapse of the opposite lung."

TREATMENT BY OPERATION. (FIG 5.)

If an operation is to be done, it should be undertaken as soon as the initial shock of the injury has passed off and before sepsis has been established. After the lapse of 48 hours it is rarely advisable to perform any operation except for evacuation of an infected pleural cavity. It was found by experience that it could be undertaken usually about six hours after admission to a clearing station—that is to say, about 12 to 24 hours after receipt of the injury.

If nothing else be done, wounds of the soft parts (unless small and clean, e.g., rifle-bullet wounds) should be excised, because otherwise they will suppurate and infection may spread along the track of the missile, into the pleural cavity, giving rise to empyema. (Fig. 6.) Excision of the wound of the soft parts should be extended down to the ribs which are frequently broken. Whether or no further operation be undertaken for opening the chest, the splinters of bone should be removed, jagged ends of rib cut cleanly off, and all dead tissue excised.

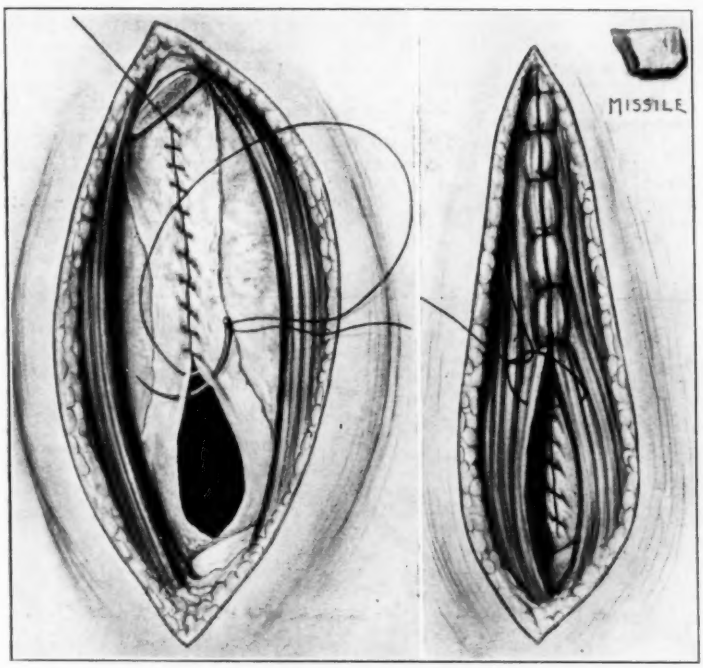
Examination of the wound in this way may reveal either a bleeding intercostal artery or a large hole leading into the chest; a finger introduced into the pleural cavity may discover splinters of bone free or sticking into the lung. At this stage the case has been converted into one of open thorax; if it is decided not to open the chest further, the blood should be evacuated by rolling the patient on to the side, and then the thorax should be closed in layers—pleura to pleura, muscle to muscle, and skin to skin.

The importance of early closure of the chest cannot be over emphasised: the relief given to the

FIG. 7.

The pleura has been incised in the line of the resected rib and the chest opened widely by means of a rib-spreader. The effused blood has been evacuated, giving a clear view of the diaphragm, in which there is a small injury: of the mediastinum, uninjured; and of the wounded collapsed lung. The hole in the lung and the rent of the diaphragm were sutured: the cause of the injury, a piece of shell, was removed from the pleural cavity and the chest closed.

FIG. 8.



Shows the first and second stages in the closure of the chest. First, the parietal pleura together with the periosteum of the rib is sutured; then the muscles, and finally the skin. The shell fragment removed from the chest is shown at the side. The patient made a good recovery without suppuration.

patient is immediate and great. Our ancestors discovered it as long ago as the 14th century, but it was forgotten time and time again. It was only on July 27th, 1917, that a memorandum was issued to the medical officers of the British Expeditionary Force calling attention to the value of the treatment of open pneumothorax by immediate temporary closure by suture.

THORACOTOMY.

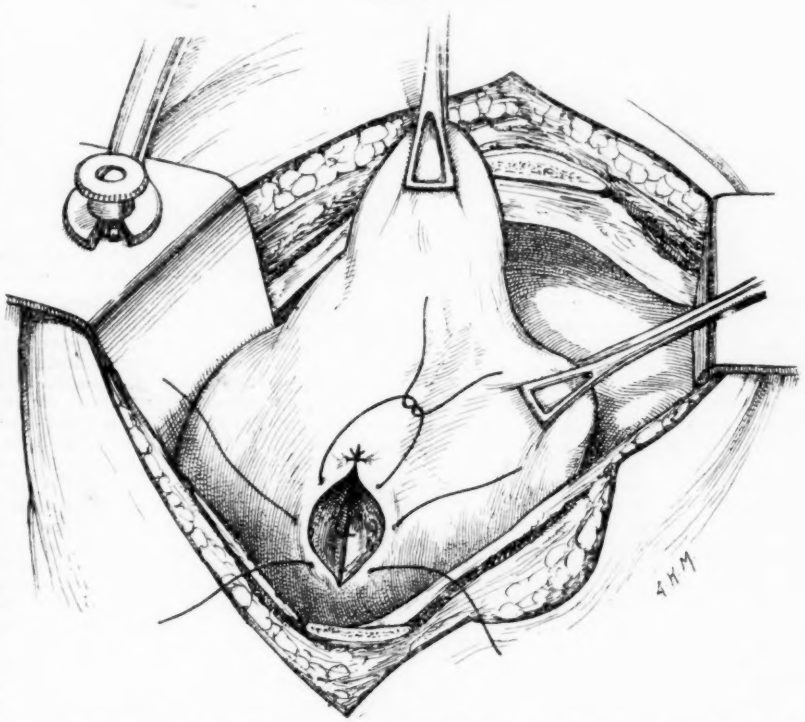
It is not difficult to open the chest sufficiently widely to allow of a complete examination of the lung and the pleural cavity. This opening may be made by excising about four inches of rib or by making an incision through an intercostal space and then inserting a rib-spreader, of which there are several efficient. The choice of route naturally depends upon the position of the foreign body relative to the wound of entry. Where possible, thoracotomy through the wound is to be preferred, for in any case the wound of the parietes needs to be excised and less damage is done to the chest wall by a single incision.

A missile may, however, lodge in the chest at a spot remote from the wound, and in such a case access has to be gained by a fresh incision. (Fig. 7.) The route that probably provides the best and easiest access is via the fifth rib in the mid or anterior axillary line, whence with the aid of a retractor or rib-spreader any part of the pleural cavity can be reached. With the chest thus widely opened the lung can be seen clearly and the foreign body may be visible; if the blood effused into the pleural cavity obscures the view, it should be remove by syphoning or mopping. If the foreign body is not visible (Fig. 8) it may be sought by inserting the hand into the pleural cavity, and removed through the wound of entry in the lung or by fresh incision into lung tissue. (Fig. 9.) Manipulation of the pleural contents can be done freely without dangerous fall of blood pressure.

TREATMENT OF WOUNDED LUNG.

Early operation, even within 12 hours after receipt of a wound, does not cause recrudescence of bleeding. Bleeding stops automatically when the

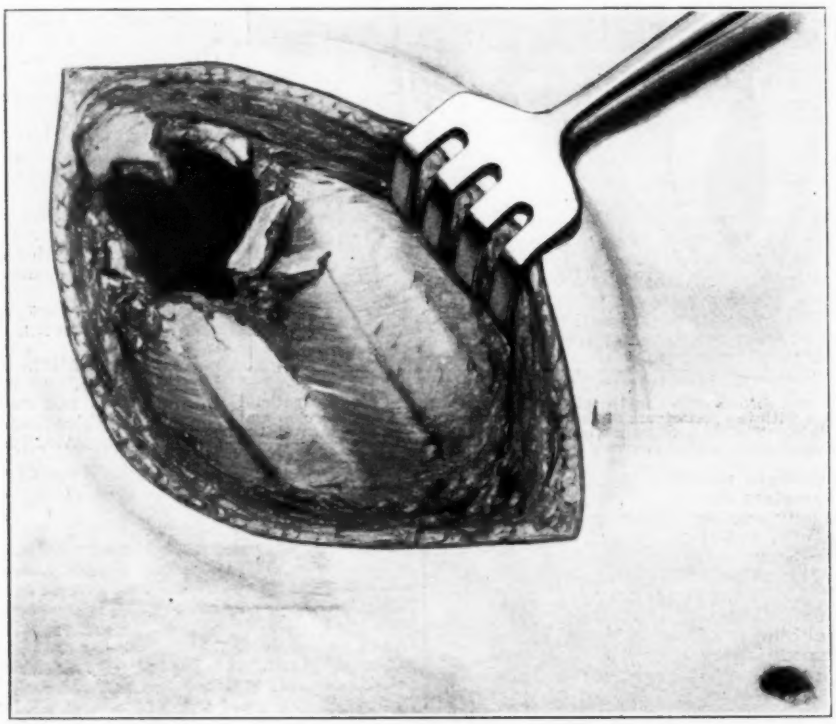
FIG 9.



Drawing to illustrate the method of suturing the lung in the previous case (Fig. 3, Coloured Plate), after excision of the wounded area. The patient recovered without suppuration.

lung collapses, unless a large vessel has been injured. Lung tissue may also be incised without fear; any fresh bleeding is easily controlled by suture. The treatment of a wound of the lung itself is sometimes difficult owing to the fact that it is undesirable to slit up a large wound so as to excise it. If the wound is readily accessible it should be excised, and if that is not practicable it should be cleansed as far as possible by wiping with gauze. (Fig. 10.) Luckily the lung is a well-aerated and vascular organ, apparently able to withstand a very considerable amount of infection. The proof of this statement lies in the fact that gas gangrene of the lung itself was of rare occurrence, though anaerobic infection of the blood in the pleural cavity was frequently met with. The hole in the lung is easily closed by suture and should be so treated. (Fig. 11.)

FIG. 10.



A perforating bullet wound with small entry and "explosive" exit. The destruction to ribs and pleura was great, and a large hole leading into the chest is revealed by the first stage of the operation.

Cleansing of the Pleural Cavity.—In all cases it is necessary to leave the pleural cavity dry and clean. The blood in it can easily be scooped out with the gloved hand and then the surface can be gently sponged. There is no objection either to washing it out with warm saline—the French use ether; but in any case it should be left dry and then closed.

Closure of the Chest.—Whether the operation has been performed through the wound or by fresh incision, the chest must always be closed completely in layers. In those cases in which there has been a loss of pleural membrane it may be impossible to bring the two edges together, and one has to content oneself with a covering of muscle and skin.

A large number of the patients treated in the manner just described made a good recovery, and in those patients who had lost a large quantity of blood recovery was aided by a transfusion of blood. Of course all the patients did not heal by first intention and a certain number of them developed an empyema which had to be drained later. A careful watch had to be kept to see that there was not an accumulation of fluid in the pleural cavity, and some surgeons adopted the principle of a daily puncture of the pleural cavity with an exploring needle, in order to keep the cavity dry. In this way they copied, but in an improved manner, the ancient custom of sucking the wound which was employed for so long in the earlier wars.

Such was the large operation which was developed for the treatment of a certain number of cases. For one reason or another, a very large group of cases were not operated on, either because there was not time or opportunity to do so, or because it was not considered necessary, and a considerable number of them became infected. It would be of great value if one could foretell which patient would become infected and which would not, for then one would forestall sepsis by an early operation. Unfortunately, one cannot do so, and all it is possible to say is that a patient who has lost a large quantity of blood is more liable to infection than one who has not.

TREATMENT OF HÆMOTHORAX.

Opinion has fluctuated as to the correct treatment of a patient suffering from hæmothorax without retention of a foreign body and without severe lacerated wounds—e.g., such as result from through-and-through bullet wounds.

Almost any patient with a penetrating wound had a hæmothorax to a lesser or greater extent. Very many men with clean perforating wounds and a small hæmothorax recovered quickly and returned to duty without disability in one or two months. Others with a large hæmothorax, had a long convalescence and recovered with a disability of shortness of breath, due to fibrous thickening of the pleura and contraction of the chest; others again became infected and developed an

empyema with all its well-known dangers and troubles. In the early days of the war it was not considered desirable to aspirate a hæmothorax for several days after the injury for fear of starting bleeding. This fear was found to be groundless, and with better knowledge it was clear that in any case of hæmothorax large enough to cause distress it was not only harmless to aspirate, but actually beneficial, and so this became the general practice. A few enthusiasts went so far as to urge that every case of penetrating wounds should be operated on, the hæmothorax emptied, and the chest closed. This appeared to be an extreme view which was not justified.

It remained, therefore, an axiom that a patient with a hæmothorax should be watched most carefully for signs of infection, so that with the first development of symptoms more active measures might be taken.

Treatment of Infected Hæmothorax.

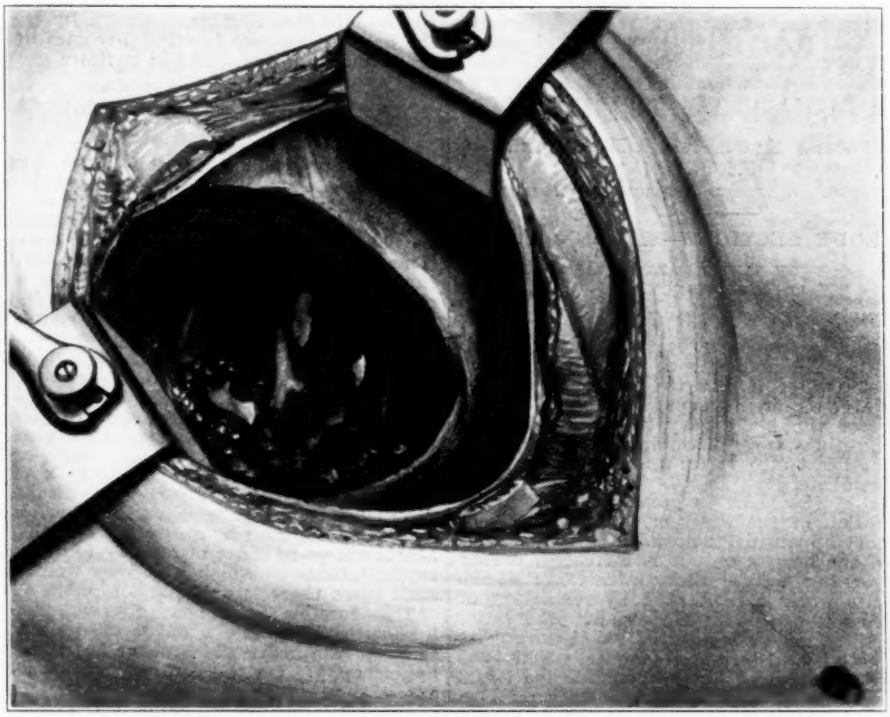
Signs of infection of a hæmothorax developed sometimes within a few days of the injury, or might be delayed for four, five, or six weeks. In the late stages where pus had formed the only treatment to be done is a drainage operation. If, however, infection developed and was recognised within a few days after the wound, it was often worth while to make a wide opening in the chest, so as to clear out the whole of the hæmothorax fluid and the blood clot. In a few cases in which infection was mild it proved possible to close the chest completely without drainage, and in others a secondary closure was made after cleansing the pleural cavity for a few days with Carrel-Dakin fluid.

The success of the procedure in these cases seemed to depend more on the amount and character of the infecting organism rather than the surgery; in general terms, the method was not successful if the infection was due to streptococci.

ABDOMINO-THORACIC WOUNDS. (FIG. 4.)

So far the subject has been considered as if wounds in the recent war were always single and confined to one cavity, as was more likely in days when men fought with sword and lance. Unfortunately this was not so, and surgeons who served with the armies must remember how often they were confronted with a man suffering from multiple wounds. A man might have a chest wound and a wound of the head, spine, or abdomen as well. Often, too, the same bullet traversed the abdomen and the chest, and these abdomino-thoracic wounds formed a dangerous and difficult class to deal with. If the intestines were perforated they had to be sutured to save life, and one had to weigh the advisability of operating on both the abdomen and the chest through separate incisions—unless it was possible to reach both through one incision, as sometimes occurred when the wound was in the lower left costal area. In doing operations in the pleural cavity one learnt how often the diaphragm was injured, and it was illuminating to realise how much easier it was to suture this structure from the superior rather than the inferior aspect.

FIG. 11.



Second stage of operation from the same case as Fig. 10. The lung, which was adherent to the parietal pleura, shows extensive laceration, and in this lacerated area are fragments of rib and visible lung vessels. In this case bleeding was still going on 23 hours after the wound, because the lung could not collapse on account of its adhesions. The bleeding points were ligatured and the chest then closed. The wound suppurated down to the lung, but the patient made a slow and satisfactory recovery.

LATE RESULTS OF CHEST WOUNDS.

Much might be said about the complications of chest wounds, of emphysema, of collapse of the lung, and a number of interesting phenomena. There is also a long chapter yet to be written on the after-results, such as the varying amounts of disability and the ultimate fate of retained missiles. Only by taking a broad view of the subject can one justly assess the results obtained.

If we may now presume to generalise, it may be said that progress has been made; but it is clear that this progress has been painfully slow, and neither steady nor continuous. It is also clear that at no time during the last 600 years has so great an advance been made as during the last war; the reasons for this advance are, broadly: The stimulus given to research by the large number of wounded, the fact that the medical services reached a pitch of excellence never previously attained, and the application to surgery of bacteriology, which supplied a rational treatment for wounds that was not understood by our forefathers.

The Relation OF HEART DISEASE AND PREGNANCY.

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IN FOUR SECTIONS—SECTION II.

THE PHYSIOLOGY OF THE HEART IN RELATION TO ITS EFFICIENCY.

Adaptability of the Heart to the Body's Needs.

THE function of the heart is to supply blood to the body. The amount of work done by the heart is not constant, for it has to vary its activities according to the requirements of the different organs. The organs of the body vary in their activities. At one time they are functioning, at other times resting. The heart also varies its activities to meet these requirements.

The work of the heart is greatly facilitated by the modification of the function of other parts of the circulatory apparatus. Thus, during the activity of an organ the heart's output is increased, chiefly by an increase in the rate of its contraction; at the same time its work is facilitated by relaxation of the blood-vessels of the active organ. The heart itself receives a greater supply of blood during its increased activity. Starling computes that the amount of blood received by the heart during effort may be three times as great as that which it receives when at rest. This increased flow is rendered possible by the peculiar distensibility of the coronary artery.

Rest and Reserve Forces of the Heart.

The ability of the heart to accommodate its work to the requirements of the body is due to certain qualities inherent in the heart muscle. When the body is at rest the heart supplies just that quantity of blood which maintains existence. When effort is made it has the power of increasing its energy to meet the new demands. There are thus two forms of heart force: one, sufficient for the needs of the body when at rest—the rest force; and another, held in reserve, and used only when an effort is made—the reserve force.

While this distinction is somewhat theoretical, and is not sharply defined, yet the difference between the heart at rest and the heart during exertion is a very real one. Its importance will be made clear when we are considering heart failure.

Response to Effort in Health.

The healthiest heart can be forced to do only a certain amount of work; in other words, the reserve force is limited. Exhaustion of the reserve force is shown by signs of distress, particularly by dyspnœa. When effort is made the heart responds and continues to use its reserve force; so long as this is not exhausted, effort causes no distress. Thus, though an individual may be able to walk a certain distance in comfort, if he carries a heavy weight he will suffer distress before that distance is accomplished. His heart is not in any way impaired, but its reserve force is exhausted sooner.

Relation of the Reserve Force to Pregnancy.

This simple statement explains many of the phenomena which occur in the heart during pregnancy. We know that this state imposes more work on the heart, and this not only in connection with the maintenance of the placental circulation, but also in respect of the additional weight carried by the mother. There are again disturbing factors in the form of interference with the shape and movements of the chest and displacement of the heart itself.

All this additional work is met by a call upon the reserve force. This is shown by the fact that the field of response to effort becomes limited; the pregnant woman cannot run upstairs so freely or so easily as was her wont.

Does the Left Ventricle Hypertrophy during Pregnancy?

The assumption that the heart hypertrophies during pregnancy is, as I have suggested already, not justified. To begin with, there is no need for hypertrophy so long as the reserve force is ample; as we shall see, when it is not ample, grave complications arise. Moreover, it is a mistake to imagine that a heart can hypertrophy in the easy fashion postulated. While it is possible that long years of continued severe effort may produce a slight increase in the size of the organ, this increase is so small as not to be perceptible in the vast majority of people who lead strenuous lives. It is a matter of observation that strong, healthy, vigorous men do not have larger hearts than men carrying on much less vigorous work. The fact that pregnant women are hampered by breathlessness in making some effort which previously they could undertake in comfort shows an earlier exhaustion of the reserve force. This does not suggest hypertrophy. Further, hypertrophy cannot be detected by a physical examination of the heart, except in those instances—for example, aortic regurgitation—in which it is very well marked. In such cases there is a big and forcible apex beat.

This forcible apex beat does not present itself in healthy pregnant women. The changes in the shape of the heart which occur are thus not due to hypertrophy. On the contrary we have a complete explanation of these changes in the displacement of the organ and the widening of the chest caused by the uterine tumour.

Relation of a Normal to an Impaired Efficiency.

The distress arising from an exhausting effort may not be due to disease of the heart, for distress can arise in health. This is well seen when any one becomes "winded" on running as far as he can. So that the phenomena of exhaustion are the same in quality in health and in disease. In health they appear more slowly, in disease more rapidly.

The distance which a healthy person can run is determined by the onset of distress. In the very young this distance is short; but with the years it gradually increases, until a maximum is reached in the hey-day of early manhood. From that period onwards a gradual decrease sets in, the distance ever diminishing, till old age is reached. There is no standard. Some people are remarkably long-winded; others, equally healthy, are short-winded.

The Purpose of Distress in Effort.

The purpose of the mechanism which thus limits for each of us the amount of effort we may undertake can fairly be described as protective; and it is well to keep this point of view in mind. It affords not only a measure of the heart's capacity, but also a rational line of treatment in heart failure. The mechanism is protective because of the universal dislike of distress. This dislike compels a man to cease effort before injury is done to his heart or other

organs which are being strained. Little consideration, therefore, is required to understand how observation of the response to effort becomes the most important method of estimating the heart's efficiency. In eliciting this response we are calling into play a mechanism which exists in every individual, healthy and diseased.

The Standard of the Heart's Efficiency.

However, the doctor is to employ this method intelligently; and to do so he must undergo very careful training. The method is apparently so simple that everybody feels confident that he has recognised it, used it, and exhausted its possibilities. As a matter of fact, few people have given it anything like the amount of study it requires. In consequence its importance and the manner of its application are only partially understood.

The standard distance to be employed in determining whether or not an individual's response to effort is limited may at first seem a matter requiring definition. I have already referred to the fact that some people are long-distance runners, while others can run only a short distance. An amount of effort which would stop the latter may thus occasion the former no trouble. From this it can be seen that each has his own standard. It is therefore the duty of the doctor, by appropriate questions and tests, to obtain a knowledge of his patient's individual capacity, both in health and disease, before he attempts to determine the presence or the degree of heart failure. This information can be acquired only after much experience, as indeed may be understood when the various elements of the problem are taken into consideration. Thus, some people with damaged hearts can walk long distances but cannot cycle, while others can cycle but are distressed by walking. Some people, again, suffer speedily on walking on a cold day or after a full meal. One man with mitral stenosis and auricular fibrillation followed his occupation as a mechanic, swinging his forehammer many hours, but had difficulty when walking up a hill.

THE LAW OF HEART FAILURE.

The Response to Effort in Disease.

The first sign of heart failure is a diminution of the power of this organ to respond to effort. The heart, as we have seen, holds in reserve a force which can be liberated to meet the demands of the body. The exhaustion of this force gives the key to heart failure. All the organs of the body, being dependent on the heart for an increased supply of blood during their activity, show an impaired efficiency when there is any failure to supply their requirements. Thus the first sign of trouble will be found not in the heart itself, but in the other organs. Their functions will be interfered with and they will give rise to symptoms.

The Nature and Mechanism of the Early Signs of Heart Failure.

Bodily exertion is the most effective way of calling upon the whole reserve force of the heart. Exertion can be carried on at the command of the will; it employs great masses of muscles, and these require a great increase in their blood-supply during effort.

While during exertion the muscles demand and receive an increased supply of blood, the other organs of the body have their blood-supply impaired. Their functions are thus not properly executed. Most of the organs afford no sign of impaired function; there are, however, organs which are extremely sensitive to a diminished or depraved supply of blood.

The failure of blood-supply occurs in two ways: (1) by an impairment in quality; and (2) by a deficiency in quantity. During continuous effort in health and in disease a time comes when the output of the heart diminishes so that the organs do not receive a supply of blood suited to their requirements. This diminished circulation through the cleansing organs results in an accumulation of waste products in the blood.

The consequences of this accumulation react upon all the organs, but there are two in particular in which symptoms of a striking and easily recognised kind are produced. The symptoms are so characteristic that we must set them down at once. They are: (1) breathlessness and its associated phenomena, in consequence of the stimulation of the respiratory reflex; (2) pain and its associated phenomena in consequence of exhaustion of the heart muscle. Both may not be present in the one individual, but one or other is always present, however slight the degree of heart failure may be. In advanced conditions other organs and tissues may show signs—for example, dropsy and enlarged liver; but these are late manifestations and are not constant.

Respiratory Distress.

The system most sensitive to an impaired blood-supply, or rather the system which most readily gives rise to sensations of distress, is the respiratory. Exactly how the distress is brought about need not concern us here; the point we are making is its association with heart failure. This is definite and beyond dispute. The impaired and impure blood-supply stimulates the respiratory reflex, so that the breathing is increased in rate. It is not, however, the rapid breathing which constitutes the distress, but that curious sensation called sometimes "air hunger," a feeling which compels the patient to take deep and rapid inspirations.

This breathlessness is the most common cause of distress in health and in disease. It is, in its quality, similar in both these states, as we have already suggested. Thus, a man in health runs a mile with ease, but suffers distress when this distance is exceeded; his heart becomes impaired, and then he may have the same symptoms of distress on running a few yards. With further impairment the breathlessness may come on during but a slight effort or even when he is at rest in bed. The reason for the breathlessness and distress remains the same in each instance. It is the failure of the heart to supply sufficient pure blood to the respiratory centre.

Pain.

The next most common distressful sensation which compels cessation of effort is pain felt in some part of the chest, usually on the left side, and in the left arm. The inquiry into the production of pain in affections of the viscera has been a long and difficult one. Indeed the subject is still somewhat confused. A certain advance has, however, been made, which shows that there are but few conditions actually capable of producing pain. One of these is the contraction—or at least a form of contraction—of muscle. It is now many years since my attention was first drawn to the fact that some of the severest pains are associated with hollow muscular organs—for instance, the uterus, the bowel, the ureter, and the gall duct. At a later period the study of heart affections revealed the fact that pain was evoked on occasions when effort was continued after exhaustion had taken place. This pain bore a relationship to the heart.

There is now sufficient evidence to show that, while the peristalsis or contraction of a hollow muscle may in many cases produce no sensation, contractions of a certain strength do produce pain. An analogy, too, exists between the production of this pain and that occurring in the skeletal muscles, for we find that, while the muscles usually contract painlessly, yet certain forms of contraction are very painful; for example, cramp. Moreover, if skeletal muscles be forced to contract when they are exhausted, or—an even more severe test—when they are deprived of sufficient blood-supply, then pain of so severe a character may arise that effort will have to be abandoned.

We find the same kind of pain arising in connexion with exhaustion of the heart. Conditions which enfeeble the heart muscle or impair its blood-supply favour the occurrence of pain when effort is made; and this pain is frequently of such severity as to cause a cessation of effort. The mechanism by which this effect is brought about is present in every individual, and the effect may be produced in the healthy as well as in those with impaired hearts. On several occasions I have noted its production in healthy people who had been exposed to great exertion for a long time; its production in damaged hearts is well known. From a study of a large number of cases, I conclude that pain arises from fatigue of the heart muscle, and is more easily produced when there is a deficient supply of blood to the muscle, as occurs in cases of disease of the coronary arteries. Its appearance in healthy people is due to fatigue from over-exertion. The pain may arise also in people whose hearts suffer, in company with other organs, from some general cause, as, for example, the poisoning from infection. I have dealt more fully elsewhere with the evidence which leads to this view of pain; I refer later to the matter under the heading of "The Neurotic Heart."

Mechanism by which Pain is Produced.

The following seems to be the mechanism by which pain and allied phenomena are produced. When a muscle is exercised beyond its power, exhaustion occurs; this acts by stimulating the nerve ends. These nerve ends convey to the central nervous system a stimulus which affects certain centres of which that giving rise to pain is one. The distress thus produced causes a cessation of the effort. The stimulation may affect not only the pain centres, but also other centres in the neighbourhood, such as the cells of nerves supplying certain muscles. In this latter instance the muscles contract, and thus we frequently find a sense of constriction as well as of pain.

Sense of Constriction.

There is, thus, a relation between the sense of tightness and the pain. In many of my cases of angina pectoris I have observed that the first consciousness of limitation of the field of response to effort is this weight or oppression or tightness across the top of the chest. The production of pain comes later. In some people effort produces first a sense of constriction; if the effort is persisted in, pain is induced. It is for that reason that I lean to the view that the compression of the chest is due to a reflex contraction of the intercostal muscles. The sensation sometimes goes so far as to cause a feeling that the chest is being gripped in a vice; this feeling resembles that accompanying the contraction of the intercostal muscles in pleurodynia, and also the hardening and contraction of the muscles of the abdominal wall in attacks of renal and gallstone colic.

It would seem, therefore, that, while the air hunger or breathlessness is produced by the defective supply of blood to the respiratory centre, the pain and sensation of constriction of the chest are produced by a defective supply of blood to the heart muscle, and therefore due to exhaustion of the heart muscle.

Relation of Symptoms to the Disease.

The question often arises: "Why do many people suffer from the same pathological state, and yet have symptoms so diverse?" We know that many people die of heart failure without having suffered any pain. From what I have said already the reader will be able to understand why I believe that this is to be explained by a reference to the sensation of distress which is first called into play. A defective supply of blood to the respiratory centre may cause such distress in the shape of breathlessness that effort ceases before the defective supply affects the heart itself. In the same way pain may be the first sign of an exhausted heart in those instances in which the blood-supply to the heart muscle is markedly diminished. This view is supported by what happens in some people who develop auricular fibrillation. In the great majority of people with this complaint breathlessness is the dominant symptom. It is produced by effort. Pain is much less frequent, and attacks of angina pectoris rarely occur. Patients who suffer from angina pectoris, and are compelled to abandon effort because of pain, sometimes develop auricular fibrillation. When this happens it is no longer pain which pulls them up, but breathlessness. Thus a man who could usually walk 200 yards before he was pulled up by pain developed auricular fibrillation, and was compelled to stop after 100 yards because of breathlessness. He had no more attacks of pain.

Exhaustion.

Inquiry into sensations which compel cessation of effort discloses the fact that there are several of these. Exhaustion is perhaps the next most important, though it is not directly cardiac in origin. It is the sensation which compels people in indifferent health to cease walking or exerting themselves—a feeling which probably everyone has experienced from time to time, and which each individual would describe in slightly different words. There are a number of different kinds of exhaustion; these can be provoked in different ways and are associated with different diseases. Into that I do not propose to enter here, further than to state that exhaustion is not a sensation provoked by a failing heart responding to effort.

This is important, because a sense of exhaustion is commonly assumed to be an evidence of heart failure. As a matter of fact the feeling is produced by another process altogether, which has as its basis a modification of the vaso-motor system. The fact that exhaustion may occur in healthy people as a temporary phenomenon and under circumstances in which no strain is put on the heart—for example, standing in a hot and stuffy atmosphere—proves this. An inquiry into the whole subject is at present being undertaken. I may perhaps say that the sensation is found to be a symptom of much significance, and that it seems to vary with the nature of the disease present. It may, of course, arise readily in people with some actual heart trouble; this, however, is a different matter from saying that it is due to the heart trouble. Its presence should invariably be regarded as a reason for the examination of the patient for some cause of ill-health other than heart disease, to which—let me repeat—its relationship is only incidental.

Palpitation.

The susceptibility of the heart to stimulation renders it liable to a variety of manifestations. There is scarcely a disease process, however trivial, or a modification of the activity of any organ, which is not reflected on some part of the cardio-vascular system; many of these disturbances affect some portion of the heart's own mechanism. It is on this account that we frequently encounter disturbances in the action of the heart when the body is at rest. As is well known, mental effort or excitement will produce an attack of palpitation. Moreover, experience shows that stimuli, from other organs, will produce the same phenomenon. When, therefore, we find a patient who complains of seemingly causeless attacks of palpitation, we should at once institute a search for the cause of these in some organ other than the heart: for it is rare, even in disease of the heart, for palpitation to arise without some extrinsic stimulus. I do not dispute, on the other hand, that certain states of the heart render it more liable to stimulation of this kind, and I mention in this connexion febrile or toxic conditions due to general infections or absorption from diseases elsewhere.

Summary of Heart Failure.

Evidences of heart failure are to be found not in the examination of the organ, but in the manner in which the circulation is maintained in the different organs of the body.

The symptoms of heart failure are to be found in the evidences of disturbed function of the organs of the body.

Such disturbed function is the outcome of an insufficient or depraved blood-supply.

While every organ of the body suffers when heart failure sets in, only a few organs produce recognisable signs.

Dropsy and enlarged liver are sometimes spoken of as "cardinal signs of heart failure," but they occur only in heart failure from certain diseases and in an advanced stage of the condition. Most cases of heart failure do not show these signs at all, or show them only at a late period.

The organs which show the most distinctive signs of heart failure are the respiratory organs and the heart itself.

Although the signs are provoked by these organs, they are not directly due to them, but to their reflex action on the nervous system.

In the case of both these organs heart failure gives rise to distress; in the one case the distress is associated with breathlessness, in the other with pain of a definite kind in a definite locality.

There are thus two groups of symptoms which are provoked by heart failure, and which afford a standard for measuring the heart's capacity.

HEART FAILURE WHEN AT REST.

Heart failure may set in when the body is at rest; when, that is, there are no opportunities for testing the effect of effort except movements in bed. This occurs in the case of people who are forced to lie up on account of an accident, or a surgical operation, or pregnancy, or acute febrile infections.

The symptoms of failure in these states resemble those of certain forms of chronic heart disease when the patient is confined to bed; for example, advanced mitral stenosis or auricular fibrillation. It is in these latter cases that the best opportunity is afforded of studying the condition.

In the inquiry I carried out I observed cases of typhoid fever, of old people confined to bed after a fracture of the leg or after a surgical operation, of pregnant women, and of chronic disease of the heart.

Earliest Signs.

The failure begins very insidiously, and unless carefully searched for it may easily escape notice until it is far advanced. The first symptom which arrests attention is a slight increase in the rate of breathing. A slight acceleration of the pulse usually accompanies the increase in the breathing. This, however, may be masked by an acceleration of the pulse due to the complaint.

Dilatation of Right Heart.

In certain cases, especially in typhoid fever or in chronic heart disease, there is an increase in the size of the right side of the heart, which is revealed by a slight extension of the transverse dullness, and by the appearance of pulsation in the epigastrium —a form of pulsation peculiar to the right heart.

In regard to these two signs, it must be noted that increase in the size of the right heart, of a mild degree, causes little increase of dullness to the right, because the right side of the heart is fixed by the attachments between the superior and inferior venæ cavæ. The increase pushes the whole heart to the left. In some cases, too, the greater part of the anterior surface of the heart is made up of the right auricle and ventricle. This can be verified by the character of the apex beat when it is present. When the apex is formed by the left ventricle there is an out-thrust during ventricular systole (Fig. 3), and an indrawing during diastole. When it is formed by the right ventricle, the reverse takes place; an indrawing occurs during systole and an out-thrust during diastole, as in the latter part of Fig. 3.

FIG. 3.—Simultaneous tracings of the heart movement (upper tracing), and of the radial pulse (lower tracing). The first part of the upper tracing was taken from the apex beat, immediately outside the nipple line, and shows a rise, due to the out-thrust of the apex, during the ventricular systole (space *E*). This out-thrust is characteristic of the movement of the left ventricle. The latter part of the upper tracing was taken immediately inside the nipple line, and shows a fall during the period of the ventricular systole (space *E*). This indrawing is characteristic of the movement of the right ventricle—receding from the chest wall as it empties.

In epigastric pulsation due to dilatation of the right ventricle, the movements are similar to those of the apex beat, when this is due to the right ventricle —an indrawing during systole and an out-thrust during diastole (Fig. 4). That point distinguishes epigastric pulsation due to the right ventricle from

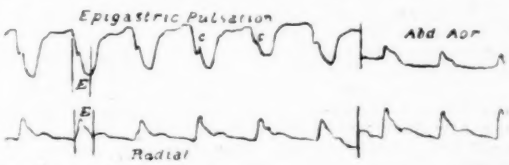


FIG. 4.—Tracings of the movements of the right ventricle in the epigastrium taken at the same time as the radial pulse. The epigastric pulsation shows an indrawing during systole (space *E*), due to the recession of the ventricle as it empties—resembling the latter part of the heart movement in Fig. 3. At the end of the tracing are two beats of the abdominal aorta, to show the difference between the epigastric pulsation of the right heart and that of the aorta.

epigastric pulsation due to other causes; for example the left ventricle, the abdominal aorta, or the liver—all of which show an out-thrust during systole. It is to be noted that this increase of the right heart may take place with no perceptible modification of the heart sounds.

Œdema of the Lungs.

The most instructive signs of early failure in bed, however, are the changes which take place at the bases of the lungs. The systematic examination of weakly people, confined to bed, reveals frequently a few fine crepitations at one or other base of the lung, behind. In the early stage of failure those crepitations disappear after the first deep inspiration. In many weakly people the condition goes no farther; in those, however, in whom heart failure proceeds, the crepitations do not disappear during deep inspiration, but persist. In course of time an impairment of the percussion note may be detected, and the condition may go on till there is marked dullness of one or both bases. Disappearance of the crepitations and the breath sounds now occurs. A post-mortem examination of such cases shows the lungs to be sodden and airless at the base. Sometimes patches of catarrhal pneumonia are found in the substance of the œdematous parts of the lung.

With the increase of this passive congestion other symptoms appear. The breathing becomes more hurried; the act of turning over in bed produces evident dyspnœa; the pulse-rate increases; if there be catarrhal pneumonia, the temperature rises with its onset, and the patient becomes manifestly ill.

Method of Detecting the Onset of Pulmonary Stasis.

It had been recognised that stasis of the lung tends to occur in cases of pregnancy complicated

by mitral stenosis. Bearing this in mind, I extended my inquiry to include not only people with damaged hearts, but healthy women during pregnancy and people suffering from any form of debility. My object was to find out whether or not crepitations at the bases of the lungs are a sign of danger in pregnancy when they occur in a woman with heart disease. I examined and kept notes of women in the manner previously described.

I found by this means that crepitations at the bases of the lung are far from being an uncommon sign. The method I adopted was as follows: I told the patient to stay in bed on a particular day. When I visited her I observed which side she lay on, and before attempting any further examination made her sit up. While I auscultated the base of the lung on the side on which she had been lying, she took a deep breath. In most cases no crepitations were heard; in others fine crepitations were heard which disappeared after the first deep inspiration.

Such people went on to full time, were confined, and suffered from no heart trouble. Even those in whom the crepitations were more persistent did not have any cardiac trouble. In all of them the crepitations disappeared during the strain of labour, though many showed crepitations at the base a day or two after the delivery. No bad consequences followed. I noted, however, that the crepitations all disappeared on taking a few deep breaths.

In those women who had mitral stenosis or auricular fibrillation, and who gave trouble on account of their hearts, the crepitations did not disappear on deep breathing, but persisted. In some the lungs became dull to persussion from an increase of œdema. The œdema occasionally grew worse till the breathing became embarrassed; the œdema after confinement was often more pronounced than before it.

While, therefore, crepitations at the base, in a healthy woman, were shown to be a sign of no serious significance, they gave an indication of danger when the pregnancy was complicated by heart disease.

Mechanism of Right Heart Failure.

While in some people heart failure can take place and proceed far without demonstrable physical sign, in others œdema of the legs is a prominent feature. It is not quite clear why there should be this difference; personally I reasoned that dropsy is in some way or other associated with a diminished force of the left ventricle, and is, in all probability, due to a diminished *vis-a-tergo*. This view was strengthened by the observation that true cardiac dropsy is always associated with a dilated left ventricle.

I had frequently been confronted with cases of dropsy in which an abnormal sign such as a systolic murmur was present. I assumed that the dropsy was due to a failing heart. But I found that some of these cases showed no enlargement of the heart, and in the course of time it became apparent that their dropsy was not of cardiac origin. I therefore came to the conclusion that in all cases of *cardiac* dropsy the left ventricle is dilated, and so is not able to overcome the peripheral resistance. What other factors there are, beyond this, I do not know; nevertheless the recognition of an association, even if it be not cause and effect, is of great clinical value.

Reasoning from these facts, I looked upon the crepitations at the base of the lungs as being due to œdema, occasioned by a diminution of the force of the right ventricle. The association of œdema of the lungs with the demonstrable evidence of dilated right heart, already described, supported this view. I then set about to ascertain why it was that heart failure should set in while the body remained at rest, and why it should take this particular form.

When one reviews the factors which favour the flow of blood through the lungs, two of these stand out prominently:

(1) The force of the right ventricle;
(2) The movements of respiration.

The force of the right ventricle is the main factor, but the free movement of the chest wall undoubtedly helps. When a heart fails the patient sits up and breathes in a laboured fashion. When a person lies down pressure is exerted upon the ribs so that their movements are restricted.

With a good right ventricle there is no difficulty in maintaining the circulation through the lungs. With a weakened one, or with an embarrassed pulmonary circulation, the case is altered and the circulation is not maintained efficiently. The blood tends to stagnate in that part of the lung which is passive during respiration. This probably is the reason why the first signs of right-heart failure are the crepitations at the base of the lung on the side on which the patient lies. I have repeatedly seen all signs of stasis disappear when the patient was made to sit up and when, at times, he breathed deeply.

The fact that mitral stenosis hinders the flow of blood through the lungs, and therefore embarrasses the right heart, accounts also for the fact that œdema of the lungs is an early sign of the failure of the right ventricle. Having assured myself of this, I put the question why it should be specially serious in pregnancy. In order to find an answer, I made a careful study of certain changes which take place in a normal pregnancy. It is perfectly evident that in the pregnant state, towards the later months, the heart is embarrassed in healthy women; for the woman is not capable of so much exertion as she was accustomed to undertake, and becomes breathless during efforts which at other times would not have inconvenienced her.

Source of Danger in Pregnancy with Mitral Stenosis.

The embarrassment of the circulation which occurs during pregnancy was described in an earlier section, where it was shown that the growth of the uterine tumour interferes with the movements of respiration by widening the thoracic cavity, preventing the descent of the diaphragm, and displacing the heart. The result was seen to be a limitation of the heart's power to respond to effort, and a tendency to stasis at the bases of the lung.

In some cases of mitral stenosis the blood is obstructed at the mitral orifice, the left auricle becomes full and embarrassed, engorgement of the lungs occur, and the right heart has a difficulty in forcing the blood through the lungs. In mitral stenosis where this state of affairs is already present the additional embarrassment caused by pregnancy places the woman in a precarious state. This point, however, will be more fully discussed under mitral stenosis.

The Back-pressure Theory of Heart Failure.

The explanation given of the mechanism of heart failure in mitral stenosis has led to the idea that this is the usual manner of heart failure, and in consequence there has arisen what is called the back-pressure theory. Although, as I have pointed out, there is some truth in this theory in certain cases, yet in the majority it gives a wrong impression. With the discovery of murmurs, and their relation to valves found damaged at the post-mortem examination, there arose the idea that the embarrassment of the circulation in heart failure was due to the incompetency of the valves. This idea seemed to be strengthened by the dropsy and œdema of the lungs which were also frequently present. It was taught that where any difficulty occurred at the aortic orifice, the left ventricle would be embarrassed, and dilatation would follow. As a result of this dilatation, the mitral valve would no longer be able to close the orifice, so that during systole the blood would flow back into the left auricle. This in time would, in its turn, become distended, and so lead to interference with the pulmonary circulation and to engorgement of the lungs. The right ventricle thus must be embarrassed also, and would sooner or later

dilate so that the tricuspid valves would be rendered incompetent and cause distension of the right auricle, and then engorgement of the veins of the body, enlargement of the liver, and dropsy. By some people to-day a tricuspid murmur is looked upon as a sign of complete heart failure.

It was on this plausible reasoning that the back-pressure theory of heart failure was built up; and it is because of this reasoning that murmurs are looked upon as being so ominous.

Seeing that this belief is so widely accepted by authorities and teachers, one might reasonably expect that, in the vast literature dealing with affections of the heart, there would be recorded at least one case showing the progress of heart failure after this fashion. I have searched diligently, but I have not found the record of one single case which could support the idea. Moreover, I have, time and again, asked its supporters to give me a record from their own experiences of heart failure arising in this way. None of them have done so. So long a period has elapsed since I first called attention to this misconception, that plenty of time has been afforded physicians to produce evidence in support of it. They have failed to produce any evidence.

The reason why the erroneous view is held is that there are present in certain forms of heart failure marked evidences of engorgement; for example, congestion of the veins, lividity of the face, enlarged liver, and dropsy. These evidences are invariably pointed to as proofs of "back-pressure." But if one watches the onset of those symptoms, one will be able to perceive that they arise in another way.

The Mechanism of Heart Failure.

While watching for a period of years the changes which gradually occurred in my patients with mitral disease following rheumatic fever, and in elderly people, I was struck with the suddenness of the onset of heart failure in these subjects. It came accompanied by great breathlessness, lividity of face, enlargement and pulsation of the liver, and dropsy. During my observations I had taken notes of the various signs; on comparing the signs before and after the onset of heart failure, I found some remarkable differences. Thus, before the onset of heart failure the organ would be perfectly regular, while after the onset it would be irregular. The irregularity, too, was of a peculiar and distinctive kind.

Moreover, while before the onset of heart failure there were evidences of auricular activity, these disappeared with the onset. (These evidences of auricular activity were movements in the jugular veins or the liver due to contraction of the auricle, as in Fig. 2, and, in some cases, presystolic mitral or tricuspid murmurs. These all disappeared on the onset of heart failure.) These changes were afterwards found to be due to the occurrence of fibrillation of the auricle.

In some of my cases the auricular fibrillation lasted but a few hours or a few days. In a few, the patient, immediately after the onset of the fibrillation, became breathless. Some hours later the face would grow livid, the heart dilate, and the liver enlarge. The heart would sometimes suddenly revert to its normal, regular rhythm—the auricle beating again in a normal fashion. In these instances the patient at once experienced a great sense of relief, and in a few hours the face had regained its usual colour, and the heart and liver diminished in size. Effort would then be undertaken without breathlessness.

While I do not profess to comprehend the whole of the mechanism of heart failure, it is manifest to me that this sequence represents a very different picture from that which could be presented by "back-pressure." So far as I can understand it, the real process seems to be as follows: In cases of auricular fibrillation with heart failure the rate of the heart becomes increased, often greatly so, while the beats are weak and ineffective, and the radial pulse is small and sometimes scarcely perceptible (Fig. 5). The chief force which sends the blood through the systemic circulation to the right auricle is the left ventricle. When we find the ventricular beats small and ineffective, it is a reasonable surmise that such concomitant symptoms and signs as dropsy, enlarged liver, and lividity are due to the inability

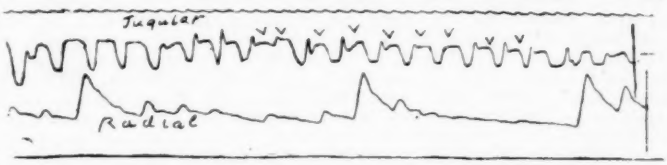


FIG. 5.—Characteristic irregularity appearing at the onset of auricular fibrillation. The upper tracing is from the jugular vein and shows large waves (*v*) with each systole of the right ventricle. The lower tracing is from the radial, and shows in addition to a marked irregularity that the beats are sometimes so small that the instrument fails to record them.

of this chamber of the heart to force the blood through the peripheral vascular system.

The inability of the left ventricle to expel its contents leads naturally to an accumulation of the blood in its cavity. Thus dilatation may occur. It is not, however, the accumulation of the blood alone which causes dilatation. In many hearts, in which fibrillation of the auricle is present, there is no dilatation. Dilatation indicates that the wall of the ventricle is damaged or impaired; its presence should always lead to consideration of the integrity of the heart muscle.

The importance of auricular fibrillation as a factor in the production of heart failure should be recognised. In my observations I found that about 90 per cent. of cases of heart failure with dropsy and enlarged liver were cases of auricular fibrillation. Moreover, in the great majority of cases of "heart-strain"—i.e. where heart failure with breathlessness has suddenly set in while the individual was making a violent or prolonged effort—the failure is due to the sudden onset of auricular fibrillation.

Auricular fibrillation is often attended by little or no impairment of the cardiac efficiency. In such cases the heart muscle is good, and the rate of the heart is not markedly increased.

There are other, but rarer, conditions which induce heart failure, but as they seldom, if ever, occur in connexion with pregnancy they need not be discussed here.

While "back-pressure" fails to account for the symptoms of heart failure, it is nevertheless a factor in some cases. In mitral stenosis there can be no doubt that the left auricle is often embarrassed, and in some cases the pulmonary circulation shares in this disability. The right ventricle hypertrophies to overcome the difficulty in the pulmonary circulation. This point is of importance as it throws some light on the danger of pregnancy in mitral stenosis.

A MEDICAL FELLOW OF TRINITY COLLEGE, DUBLIN. Trinity College, Dublin, up to a few years ago elected one Fellow annually as the result of an examination in mathematics, classics, and philosophy. But under recent regulations it can, if it thinks fit, dispense with an examination and choose its Fellows where it will. The choice this year has fallen on Dr. W. R. Fearon, assistant to the King's Professor of the Institutes of Medicine, who has done much useful work in physiological chemistry. Apart from his work in science, Dr. Fearon's course in arts was distinguished. Among his honours is the vice-chancellor's medal for English poetry. Although Dr. Fearon is the first medical man for a long time to be chosen a Fellow, it has always been the custom for at least one Fellow at a time to devote himself to medicine subsequent to election. In former times the Board of Senior Fellows always included a *socius medicus*, and many who held this post were very distinguished in medicine as well as in arts.

THE SCHICK REACTION

AND DIPHTHERIA PROPHYLACTIC IMMUNISATION WITH TOXIN-ANTITOXIN MIXTURE.*

BY A. T. GLENNY, B.Sc., K. ALLEN, AND R. A. O'BRIEN, M.D., D.P.H.

(From the Wellcome Physiological Research Laboratories, Herne Hill, London.)

THE Schick reaction and diphtheria prophylaxis by active immunisation with toxin-antitoxin mixtures together constitute the greatest advance in our knowledge of the problems associated with diphtheria since the introduction of antitoxin. It is probable that when public opinion is sufficiently familiarised with these two methods and their significance, they will come into universal use and there will follow the same reduction in the occurrence of diphtheria that has been brought about by Jennerian vaccination for small-pox. Dr. Park of New York advocates the injection of all children between the ages of 6 months and 2 to 3 years. It is probable that the adoption of this method would lead in a very short time to the disappearance of diphtheria in the community. The methods are, therefore, of importance to those responsible for public health and to the immunologist.

We owe the intradermic skin reaction to Schick, and the active immunisation (which was foreshadowed many years ago by that prolific worker, Theobald Smith) to von Behring. Most of the work in this field has been carried out by von Behring and his colleagues in Germany, and by Park and Zingher in New York. It is a pleasure to acknowledge the generous manner in which Dr. Park and his colleagues have placed their material at our disposal.

Technique of the Reaction.

The Schick test consists in the intradermic injection of 0·2 c.cm. of a dilution of diphtheria toxin containing in 0·2 c.cm. 1/50 m.l.d. for a guinea-pig. The quantity of toxin actually used is about 0·0004 c.cm. of an ordinary aged toxin. When we use a concentrated toxin similar to one recently prepared by Dr. P. Hartley, we inject about 0·000 016 c.cm., which contains 0·000 000 02 g. of nitrogen.

Four types of reaction are shown: "negative" given by people with antitoxin in their blood; "positive" by those without antitoxin. The positive consists in a persistent red flush at the spot where the unheated toxin was injected, whereas no reaction appears where the heated toxin was given. A third group ("pseudo") give a reaction, but have antitoxin in their blood. These people respond to the injection of broth in which diphtheria bacilli have been grown, and which has subsequently been heated to 75°C. for 10 minutes. This heated toxin contains practically no "true" toxin; it produces no reaction in the skin of a guinea-pig and large quantities can be injected subcutaneously into guinea-pigs without harming them. The response given by these people is called a pseudo-reaction and is due to some unknown constituent. It is commonly stated to be due to bacillary protein, but we cannot find any authority for this statement and we propose to investigate the truth of it. The fourth group ("combined") consist of those who are sensitive to toxin and also to the "pseudo" constituent. At the site where the heated toxin was injected they show a reaction, while at the site where the unheated toxin was injected there appears a much larger reaction, which is the sum of the "true" toxin reaction and the pseudo-reaction. These people are not immune to diphtheria. (We are emphatically of opinion that in carrying out the test injection of toxin alone may lead to dangerous confusion. It is imperative that the control, heated toxin, be injected into one arm and the unheated into the other.)

The pseudo-reaction is rather puzzling. Park and Zingher in their very large experience have not found it in infants or young children whether immunised or not; it begins to appear at 5–10 years of age, and becomes much more frequent in adult life. If it is a specific response to the protein of diphtheria bacilli, then one would expect it to appear more or less in parallel with the immunity to diphtheria toxin, but it does not do so. It does not appear for certain in those who have had diphtheria and recovered, and who months later may have antitoxin in their blood. It does not occur in the babies either of those mothers who show a pseudo-reaction or of those who do not. One German observer records a series in which 10 of a group of 20 mothers showed pseudo-reaction, whereas none of the 20 babies did so. The cell sensitiveness is therefore not transmitted diaplacentally. The concentrated toxin referred to earlier unfortunately produced a pseudo-reaction, although its nitrogen content is extremely low. Ordinary toxin boiled for 30 minutes has produced a pseudo-reaction in one of us.

Preparation of Toxin for the Schick Test.

We have hitherto advised the issue of diluted toxin only for several reasons. There is an error in "filling" capillaries with toxin, as described by Zingher last year. We are of opinion that the clinician is liable to introduce an error in dilutions owing to the difficulty of getting the whole of a minute drop of toxin, which is about 1/50 of a c.cm., into the diluting fluid. Earlier in our work a batch of toxin diluted in the laboratory sometimes failed to pass our guinea-pig test. It is evident that the conditions must be very rigidly controlled, or the dilution of toxin will not be of standard strength. A serious mistake might arise if practitioners used weak toxin and, because of erroneous reactions, concluded that certain patients were immune and might be safely left exposed to infection—e.g., in a school epidemic—or, on the other hand, might be safely left without the injection of antitoxin though suffering from membranous sore throat. (Recent work makes us hope that we have succeeded in finding a stable dilution.)

We therefore make a toxin dilution each week and test it intracutaneously on normal guinea-pigs. We find the m.r.d.—i.e., the minimal dose that will produce a reaction when given alone—and also the dose that, when mixed with varying quantities of antitoxin, will give a reaction. Our current toxin dilution ready for the Schick test, when further diluted 20 times, causes a reaction in the guinea-pig's skin; 0·1 c.cm. when mixed with 0·0004 of a unit of antitoxin and injected intradermically, must also produce a definite reaction.

Stability of Diluted Toxin.—The details of tests presented show that the diluted toxin when kept at 0°C. undergoes practically no deterioration in four weeks, whereas after seven weeks a loss of about 30 per cent. in value is found. After seven days at 15°C. the loss in potency is just detectable, while after 14 days the loss is about 30 per cent. When kept at 37°C. the dilution deteriorated seriously in one day.

Reliability of the Test.

During the past few years we have tested some of the laboratory staff many times and have obtained consistent results. Park and Leete found in repetitions of tests on the same patients by the same observer a discrepancy of a few per cent. only. We were interested to observe that most if not all of these discrepant observations relate to patients who had been positive, and, later, became negative. We have experimental evidence that the very small amount of toxin present in the Schick test dose will produce an increase in the antitoxin concentration of the blood. The details of some experiments on rabbits show that five days after the injection of a Schick test dose the antitoxic content of the rabbit's blood had risen above the level at which the Schick

* Read before the Pathological Section, Royal Society of Medicine, April 19th, 1921.

reaction fails to appear in human beings. If the same effect, as shown, had been produced in human beings, the first Schick test would have given a positive result, whereas another test of five days or more later would have given a negative result.

The Schick test is roughly quantitative. A positive reaction does not indicate the total absence of immunity. The test does not divide the population into black and white, but rather into those darker or lighter than a certain shade of grey. If Schick had originally determined on 1/500 of an m.l.d. instead of 1/50, it is practically certain that numbers of people who give a positive response to the present standard Schick would give a negative reaction with the weaker dilutions, and would be considered immune to diphtheria. Roughly speaking, people with at least 1/30th of a unit of antitoxin per c.cm. of blood give a negative reaction, while those with less than 1/30th, or with no antitoxin at all, give a positive reaction. As the result of clinical experience Schick decided that it was safe to assume that people with 1/30th of a unit were immune to clinical diphtheria.

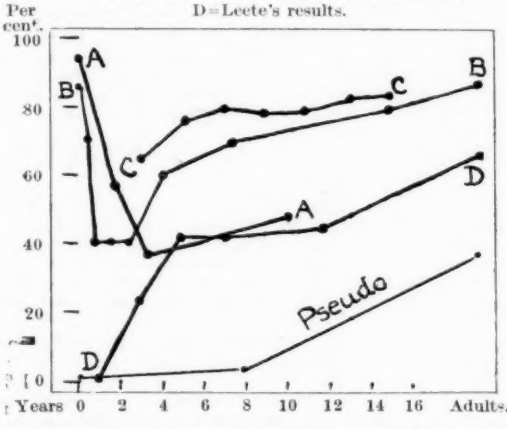
Results Obtained.

Recent observations on 18 members of the laboratory staff showed that 10 of them contained less than 0·0005 of a unit of antitoxin per c.cm. of blood—i.e., they probably contained none at all. Eight contained from one-fifth of a unit to 1 unit. Of these eight, six gave pseudo-reactions. Observations made from 1913 up to the present show that some of the laboratory staff have in their sera a greater concentration of antitoxin now than they had seven years ago. It was very interesting to find that three people, who had had abundant chance of becoming infected while working in diphtheria wards, gave positive reactions and had no antitoxin in their sera. It would appear that non-immune people may escape infection, and a suggestion arises that there may be some protective mechanism, bactericidal or otherwise, in addition to the antitoxin defence. There may be such an additional defence, but, on the other hand, we are told that in the history of infectious diseases hospitals many resident medical officers who have worked for years in diphtheria wards have assumed that they were immune, but have, later, succumbed to diphtheria. Our colleagues, presumably, did not suffer from the disease because they were fortunate enough to escape the implantation of bacilli on their mucous membrane.

The only clinical observations published in England are those made by Leete. His figures are of the same

Age Distribution of Negative Schick Reactions.

A=Schick's results. B and C=Park's results. D=Leete's results.



order as those of Park. Leete has published a series of observations in England. His results on patients over 4 years old, in the main, agree with the results of other investigators, shown on the graph. The discrepancies between Leete's observations on very young children are probably due to the smallness of the number of patients available. It may be that the differences in level between the curves obtained by Park and these other investigators are due to differences in population or to the use of a slightly different strength of toxin. We have some experimental evidence to suggest that the prescribed standard of "1/50 m.l.d. for a guinea-pig" may not be precise enough. We have not, however, completed our observations on this point.

Toxin-antitoxin Mixture.

The toxin-antitoxin mixture we have used complies with the American Government regulations. Although von Behring does not give the full details of his mixture, it is fairly certain, from the perusal of various German articles, that his mixture contains relatively more antitoxin than the American and ours. One would expect the antitoxin response of injected patients to be less than after the use of the American mixture, and so far as we can judge from the German literature, this is what is found. In 1 c.cm. of mixture, there are three L+ doses of toxin and about 3·5 units of antitoxin. A sample test of our current batch showed that three guinea-pigs injected with 1 c.cm. were all alive and well 30 days later, while of 17 guinea-pigs injected with 5 c.cm. of the mixture two died of an intercurrent disease (probably *B. Gaertner* infection) which was epidemic at the time, and 14 showed diphtheritic paralysis, most of them dying between the twentieth and twenty-ninth day. The injection of the toxin-antitoxin mixture into normal rabbits produced a satisfactory degree of immunity within 8–12 weeks. A quicker method of testing the antigenic suitability of a mixture consists in injecting it into a rabbit already possessed of a low degree of immunity. In one rabbit thus injected the concentration of antitoxin per c.cm. of blood rose from 0·004 units per c.cm. to 0·08 units four days later, and in six days to 0·5 units.

With regard to the period that elapses before an injected child becomes immune, it has been found that about 90 per cent. of children who have received three weekly injections of 1 c.cm. of a mixture give a negative response to the Schick test three months later. A negative response indicates a concentration in the blood of at least 1/30th of a unit of antitoxin. It is quite possible that a much lower content of antitoxin reached within a period of some weeks in the blood of a child who has been actively immunised recently would be sufficient to produce a considerable degree of protection against clinical diphtheria. Experimental evidence obtained by one of us (A. T. G.), and as yet unpublished, convinces us that the first minute amount of toxin conveyed into the system of the patient from the diphtheria bacilli that had gained a lodgment in the throat would produce an immediate and great increase of antitoxin in the patient's blood sufficient to neutralise further quantities of toxin produced by the attacking bacilli.

Conclusion.

Unfortunately we cannot bring forward a long series of results of the injection of toxin-antitoxin mixture. English physicians in charge of schools, institutions, and infectious disease hospitals have apparently been too busy up to the present to be able to investigate these two methods. In America the Schick reactions that have been carried out number many tens of thousands, and thousands of active immunisations have been done. The main purpose of this paper is to try to induce those who are fortunate enough to have large clinical opportunities to apply these two methods. We hope that some investigations may be carried out in London, for we believe that until much more experience has been gained in England, it would be very desirable for the laboratory investigator and the clinician to work in close coöperation. We may by working together succeed in explaining difficulties and discrepancies that are bound to be met with when new methods such as these are first used.

POST-WAR NEUROSIS.

BY S. HERBERT, M.D., M.R.C.S., L.R.C.P.

THERE still exists among English psychotherapists a good deal of reluctance to recognise to the full the importance of the sex factor as a cause of psychneurosis. Though strenuous efforts are being made to find a substitute theory which will exclude sex, facts have so far proved too strong for such a procedure to have success. Even Dr. Rivers, who in his latest book attributes war neurosis to "a disturbance of the relatively simple instinct of self-preservation," admits at the same time that "the great majority of the neuroses of civil practice depend on failure of balance between the less simple sexual instinct and the very complex social forces by which this instinct is normally controlled."[1]

The cases recounted below add a striking testimony to the truth of Freud's sexual theory of neurosis, while incidentally furnishing an experimental truth of the oft-made observation that war tends to loosen the moral restraints, built up so painfully during civilised life. In our cases we have found that the return to the normal conditions of society, with its dull routine of conventions, led to an outbreak of a neurosis in persons who, in good mental health before the war, passed through the war itself in a most satisfactory manner. This kind of neurosis, in a sense a consequence of the war, being due to the sudden reversion of life from war to peace conditions, may be aptly described as post-war neurosis.

CASE 1.—A professional man of 40 served in the Western Army during the war. He was extremely happy in his work there, and hated coming back to the narrow conditions of his civil life. As usual, he attributed his breakdown, which occurred shortly after his return, to overwork. His chief complaint was that he could not do his work. He was constantly afraid of committing gross blunders which would get him into trouble. The depression ultimately became so great that at times he seriously contemplated suicide, from which he was kept only by consideration for his wife. Though strictly moral in his sex relationships, he always felt himself to be of a somewhat frivolous temperament. This found plenty of outlet under the conditions prevailing in the war zone, without, however, leading to more than pleasantries and innocent flirtations. He masturbated in his youthful days, the sinfulness of which haunted him right through life. His wife, to whom he was devoted, is of a rather frigid temperament, and does not represent the type of woman who most attracts him sexually.

It soon appeared during the psycho-analysis that it was the repression of the sexual freedom enjoyed during the war that had produced the neurosis in the patient; and, indeed, the pursuance of the treatment on this line soon produced a remarkable improvement of the patient. He recovered his spirit and is now able to do a full normal day's heavy work.

CASE 2.—A clerk, aged 30; was four years in the army, at the front 2½ years, being promoted from the ranks and serving as an officer to the entire satisfaction of his superiors. He felt very happy among his fellow officers and liked his army work very much. Though of a rather timid nature, he managed to "gulp down" his fear so completely that he became a successful leader of his men. He married at the beginning of his enlistment a girl he had known for years, with whom he is very happy. On his discharge from the army he was at a loss what to do, being disinclined to return to his old work which he disliked. Just as he was settling down to take up some new work he had to undergo a slight operation, which, though completely successful, interfered for the time being with his new profession. Thereupon he became frightfully depressed, feeling that he would never do any good again, that ruin was staring him in the face, &c. In this state he consulted me. Being always of a rather diffident nature, he now was convinced that he was "an utter good-for-nothing," who would never be able to look up again. He had lost all sex desire for his wife.

Here seemed to be a case where repressed fear might have been the cause of the neurosis. During the actual course of analysis, however, this soon proved to be fallacious. One of his earliest associations brought to light the fact that what weighed heaviest on his conscience was the circumstance that he had allowed himself to be tempted to have illicit intercourse at the front. Though this had happened "once, and once only," he felt in his own eyes degraded for ever. Strange to say, nevertheless, he felt that having always been as a boy of a sober and rather shy nature, he had not enjoyed life like other lads. The war had given him a taste of the lighter side of life among the officers which he missed very much on his return home. Further analysis showed that this was the complex which he had tried to repress with all his might since he had come back, and which had ultimately forced its way out in the form of an anxiety neurosis. Analytical elucidation of the conflict ultimately restored the patient to full health. His sexual desire for his wife returned and he lost all fear of the future.

CASE 3.—A young tailor of 22, who had been in the army two years, but had never been to the front. He had been a shy, retired lad, not associating much with girls for fear of the harm it might do him. He never could get used to army life, felt lonely and homesick, and made, as he himself confessed, a very bad soldier. He kept well for some months after his demobilisation, but could not adjust himself to his previous work. He was suddenly seized with fits, which came regularly two to three times a week, especially towards night-time. The fits had, at first sight, very much the appearance of epileptic fits, though the possibility of their being hysterical was not excluded. Psycho-analytical treatment was recommended as holding out some prospect of cure, however faint. The success of the treatment entirely justified the advice given. Psycho-analysis soon revealed the sexual origin of the seizures. In the first place it transpired that the patient had given way to his sexual desires, inhibited so long during civil life, in no moderate degree. Always in fear of having to go to the front, he threw health scruples to the winds, thinking he would have "a good time" at any cost, and hoping, if he did break down, that it would at least save him from having to go into the trenches. Secondly, it became clear during the psycho-analysis that even in his youth his sexual desires had had the mastery over him; for though he did not actually associate with girls, he suffered from excessive sex phantasies which often produced a sort of stupor in him. Indeed, these states of mental absence were nothing less than the equivalents of sex indulgences. His fits proved to be merely the last extreme form of these mental absences. The repression he had had to exercise since his return to normal civil life—fear of consequences once more getting the better of him, as he now once more had "the will to live" in its normal form—led in its ultimate consequence to the fit as the unconscious equivalent of sex indulgence. Patient was completely cured of his fits, which so far, after 1½ years, have not returned.

What is characteristic about these cases is that in all of them sex repression was present before the war, without, however, leading to an actual neurotic breakdown of the patient. Life in the war zone tended to mitigate the condition of the patients rather than to accentuate it. They only broke down when the extended liberties enjoyed for the first time during the war had suddenly to be foregone once more with the return to civil life. This can only be explained on the assumption that the sudden repression of the temporarily released libido produced the neurosis according to the strictly Freudian mechanism.

Another case seems to point to the same conclusion. A working man, aged 40, came with a complaint of emissio præcox. He was married, and had suffered from the disease only since his return from the war. "Out there" he had taken things in a rather lax way, and he now found the restrictions of a monogamous life not at all to his taste. As the patient could not afford prolonged treatment, the case could unfortunately not be followed up.

Those who try to minimise the sex factor in neurosis should not forget that man's tendency is essentially poly-erotic. This poly-erotism must not be confused with polygamy. A man—and perhaps this also applies to a lesser or larger extent to women—may be married and truly devoted to his partner, and yet be full of other fancies.[2] It is when these become subject to strong repression that, under

[1] W. H. R. Rivers, Instinct and the Unconscious.

[2] S. Herbert, M.D., Fundamentals in Sexual Ethics.

certain circumstances, they lead to the outbreak of a neurosis. It is the recognition of the sex factor which enables us to deal with such a neurosis in a satisfactory manner and effect a proper cure by means of psycho-analysis. Case 3 has an additional interest as showing that what appears to be epilepsy is often merely a masked hysterical fit which can be successfully treated by the psycho-analytical method.

HIPPURIC ACID SYNTHESIS TEST
AS REGARDS THE FUNCTIONAL CONDITION OF THE KIDNEY.

BY P. L. VIOLLE,
MÉDECIN-CONSULTANT À VITTEL.

IN THE LANCET of April 17th, 1920, I stated in a letter that the study of hippuric elimination may give useful data as regards the functional condition of the kidney, and I wrote: "Hippuric acid elimination is profoundly influenced by diet. Hence it is necessary to base a test on conditions not dependent on the intaken food." The normal amount of hippuric acid having been estimated, we give the patient a dose of 0·50 g. of glycocoll and 50 g. of benzoic acid. From the time of taking the doses the total amount of urine is collected during 24 hours. The analysis should show an excess over normal of about 0·74 g. for 24 hours. Since the normal output for a healthy subject is about 0·40 g. the figures we should expect to find are somewhat as follows: 1·14 g.—that is, 0·40 g. the normal amount, and 0·74 g. the amount synthesised from the benzoic acid and glycocoll we have given. When the figure is lower, say 0·50, 0·40, &c., it may be asserted that the hippuric function is abnormal, and that probably there is some renal parenchymatous disorder.

Since my communication I have carried out researches to ascertain the relations which may exist between eliminations of hippuric acid and functional renal disturbances. In addition I have been desirous of proving to my satisfaction that the synthesis of hippuric acid is rather a function of purely renal origin, and in particular that it is not influenced by functional disturbances of the liver. The work is classified according to three clinical divisions of patients: renal, hepato-renal, and hepatic.

The following cases are typical examples:—

1. *Renal.*—Female, aged 20. Chronic uræmic nephritis for the last 10 years. Examination shows: albuminuria; excess of urea in the blood; blood pressure, max. 190 mm., min. 130 (Pachon). Ocular disturbances and constant headache for several years. Hippuric acid test: 0·10 g. instead of 0·74, the amount normally synthesised when 0·50 g. of benzoic acid and 0·50 g. of glycocoll are given. Second examination (a fortnight later), urea in the blood normal; blood pressure, max. 180, min. 120. No more ocular disturbances, no more headache. Therefore considerable amelioration of symptoms, except of arterial tension. Acid hippuric test; 0·27, instead of 0·74. Hippuric acid elimination: Jan. 4th, 0·18; 5th, 0·18; (test) 6th, 0·45–0·18 = 0·27; 7th, 0·18. The test of the hippuric acid synthesis shows that the state of the renal parenchyma is not ameliorated, and the blood pressure, always raised, is in ratio with the functioning of the renal parenchyma. The elimination of methylene-blue, when absorbed, lasts eight days.

Male, aged 60. Suffering from gout. First attack when aged 36. Feet œdematous. Big toes enlarged. Ulceration of and tophi in the feet and elbow-joints. Two attacks of gout a year for the last 25 years. General condition bad, never feels well, nausea, no sleep, no appetite; liver normal. Examination shows urine moderately abundant, no albuminuria, urea in blood normal; blood pressure, max. 250, min. 190.

Hippuric acid eliminations: Jan. 5th, 0·27; 6th, 0·28; (test), 7th, 0·27–0·27 = 0; 8th, 0·27. As in the preceding case the high blood pressure continues to be in ratio with the disturbances of the renal parenchyma, as evidenced by the hippuric acid test.

Male, aged 38. Arterial hypertension, without albuminuria, urea and chlorides normal; blood pressure, max. 200, min. 120 (Vaquez). Hippuric acid test perceptibly diminished, 0·59 g. instead of 0·74 g. Methylene-blue test similarly indicates that the kidney is slightly affected. Hippuric acid eliminations: Dec. 8th, 0·36; 9th, 0·38; (test), 10th, 0·95–0·36 = 0·59; 11th, 0·34. Thus the arterial hypertension is still in ratio with the renal disturbance shown by the test of hippuric acid synthesis.

2. *Hepato-renal.*—Male, aged 50. Admitted to hospital in state of coma. Generalised icterus, ammoniacal odour in breath, Cheyne-Stokes respiration, myosis, for many years slight signs of Bright's disease, urine scanty, some traces of albuminuria. Excretions of hippuric acid followed in the course of the attack, without the test of the synthesis being made, were as follows:—

	Azotæmia.	Hippuric acid.
1st day	1·81	0·25
2nd ,,	2·40	0·10
3rd ,,	2·14	0·16
4th ,,	2·66	0·08

There is a parallel between these excretions of hippuric acid and the retention of urea, and in the course of the acute attack the hippuric acid excretion forms a good index to the state of the kidney.

3. *Hepatic.*—Male, aged 40. Malarial subject and alcoholic. At the age of 31 he was treated in the colonies for enlarged and painful liver, with icterus and abdominal distension. Present state: alcoholic cirrhosis, emaciation, subicterus, liver enlarged and projecting four fingers width beyond the costal fossæ, hard and painful upon palpation; abdomen distended, no collateral circulation, no ascites, spleen normal. Urine normal in amount, no albuminuria, no sugar, urobilin in large amount, no bile-salts, urea 18 g., Maillard's coefficient 14 per cent. When Roch's test was carried out (absorption of 0·002 g. of methylene-blue by ingestion), after half an hour the methylene-blue appeared in the urine and persisted for 24 hours. Well-marked hæmoclasic shock following injection of milk (Widal). Consequently hepatic insufficiency. Hippuric acid test, synthesis completely effected 0·70. Hippuric acid excretion: Jan. 19th, 1·52; (test), 20th, 2·40–1·80 = 0·70; 21st, 2·08; 22nd, 1·85. The hepatic insufficiency has not therefore in any way affected the hippuric acid synthesis.

Summary.

1. The arterial hypertension is fairly closely connected with the renal condition so far as it has been possible to discover that condition by testing the hippuric acid synthesis in the cases under observation.

2. The azotæmia, chloridæmia, and albuminuria are evolved by crises. The modifications observed in the hippuric acid synthesis appear to be rather the reflection of functional parenchymatous disturbances that are capable of gradual modification.

3. The hepatic disturbances, since they are not accompanied by renal disturbances, fail to effect any modifications in the hippuric acid synthesis, which appears to be of purely renal origin.

From the point of view of hydrology these findings may explain the results obtained in cases of arterial hypertension by means of treatments by diuretic waters which act energetically on the renal parenchyma. For example, in the course of the Vittel treatment one frequently sees not merely a persistent lowering of the maximum tension—a result which is easily obtained by means of other treatments, but at the same time a simultaneous lowering of the minimum tension, which alone is of any value. On the other hand, I have noted that diuretic waters favour the production of hippuric acid, exciting the renal parenchyma, sometimes to such an extent as to double the output.

SOUTH LONDON HOSPITAL FOR WOMEN, CLAPHAM COMMON.—A garden fête will be held at this hospital on Friday, June 24th, when Princess Helena Victoria will open a sale of work in aid of the funds.

Mr. F. B. Power, Ph.D., was recently presented at Washington, by Mr. Henry S. Wellcome, with a gold medal specially struck to commemorate his services to science during 18½ years as director of the Wellcome Chemical Research Laboratories, London. Dr. Power's researches have been chiefly concerned with the constituents of plants, and more especially those plants used in medicine, and during his directorship some 170 papers were contributed to scientific societies from the Wellcome Laboratories.

THE EVIL EFFECT OF EXCESS OF PROTEIN ON MILK SECRETION.

BY GLADYS ANNIE HARTWELL, M.Sc.

(From the Physiological Laboratory, Household and Social Science Department, King's College for Women, Kensington, London.)

OUR experimental knowledge concerning the relation between diet and mammary secretion is not extensive, but it is generally believed that the amount of protein in the mother's diet is an important factor, and great stress is laid on the necessity for giving a larger proportion of protein than normal. It is also recognised by the farmer that a cow in full milk should have a high protein ration. But in a recently published investigation [1] it was found that adding a quantity of caseinogen to the diet of a nursing rat caused the baby rats to die, while the mother remained in apparently good health.

This extraordinary result might have been due either specifically to the caseinogen, or to the fact that excessive protein was being given to the mother rat. To settle this point other proteins were substituted for the caseinogen, and in no case were the litters normal; many, if not all, of the babies died. The few which survived the lactation period were not successfully weaned and lived only a few days after being separated from the mother. None the less the mothers often throve, if appearance and body weight are accepted as criterions.

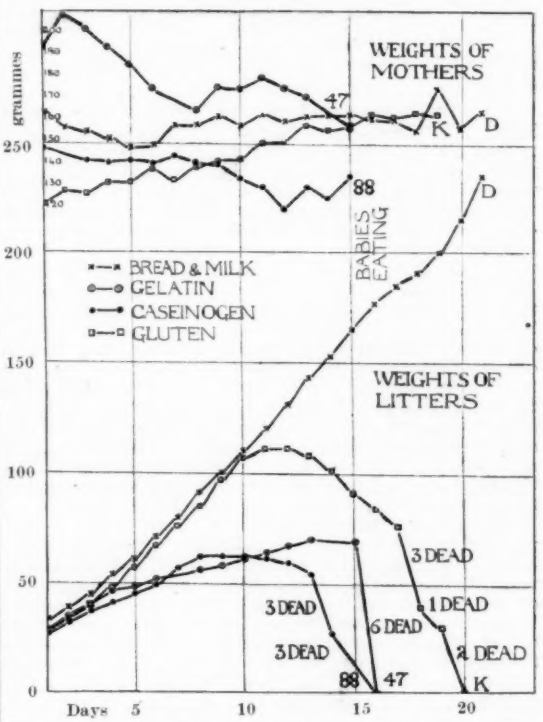
Method of Test Employed.

The litters used were strong and healthy at birth and born of healthy mothers. The mothers were fed on a mixed diet during gestation. The number of the litter was reduced to six to avoid any strain on the mother. (A rat can rear as many as 13 or 14 young.) Mothers and litters were weighed every day, the mothers being allowed to eat as much as they liked. The amounts eaten were weighed. Water was given ad lib. When caseinogen was fed to the mother rat (in the proportion 15·0 g. bread to 5·0 g. caseinogen) the litter did well until about the eleventh or twelfth day, when they ceased to gain any appreciable amount, then lost weight and died. For a few days before the change in the rate of growth appeared, great excitability was noticed. The babies squeaked, kicked and struggled considerably when taken out of their cage. Later they exhibited extensor and contractor spasms, inability to crawl properly, and when still older dashed wildly about, biting their mother and each other. After such fits and just before death extreme exhaustion was evident. The babies were thin and emaciated, and post-mortem examination showed the stomach and intestines to be almost devoid of contents. The intestinal walls were thinner than in a normal animal of the same age. Other proteins used were egg and blood albumins, gelatin, gluten, dried fish, and dried meat-protein.

Effects on Litters.

The effects on the litter were much the same as those already described for caseinogen, the babies nearly always died, and their alimentary canals were practically empty except for small amounts of liquid material and gas in the large intestine. The better the protein, the more drastic the effects—for example, the babies of caseinogen-fed and meat-fed mothers developed worse spasms than those babies whose mothers received gelatin or gluten. Again, the former were very excitable for several days, while the latter exhibited this feature for a short time only, and in some instances it was absent altogether, extreme weakness developing at a much earlier stage. Typical growth curves of the mothers and young are shown in the diagram, and are compared with the maximum growth yet obtained for any litter (example D). Rat D was fed on white bread and milk, a diet physiologically complete in all respects. Whether milk contains any specific stimulus for mammary secretion, or whether it is merely good as containing the necessary foodstuffs, &c., in suitable proportions remains to be proved. It is interesting that litter K (the mother of which was eating an excess of caseinogen) achieved optimal growth until the tenth day, after which it lost weight and finally the young died. Rat 47, which had gelatin, a defective protein, in her diet, lost weight rapidly, and to a far greater extent than if she had been fed on bread only.

The better the protein fed to the mother the more rapid, up to a point, the growth of the young, yet



Curves showing weights of mothers and litters. D, Normal growth, diet of bread and milk. K, Diet of bread and caseinogen. 47, Diet of bread and gelatin. 88, Diet of bread and gluten.

with excess of any protein in the mother's diet, the babies eventually die (or if they survive are by no means healthy or normal). It is suggested that this is due to failure of the milk secretion, preceded by some change in composition which is responsible for the spasms and abnormal condition of the babies. It is unlikely that nursing women ever take a dietary containing nearly as much protein as carbohydrate and practically no fat. But if we may argue from rats to human beings, it is clear that excessive proportions of protein in the mother's diet may lead to metabolic and nervous trouble in the suckling. In view of their possible medical application these experiments are briefly described. A fuller account will be published in the near future.

[1] Biochemical Journal, vol. xv., p. 140, 1921.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Prince of Wales's General Hospital, Tottenham, N.15).—Clinical Demonstrations, free to medical practitioners, will be held on Tuesdays, Wednesdays, and Fridays, from June 14th to July 22nd. Further particulars will be found in our Medical Diary. An Intensive Course of two weeks duration will be held in September, consisting of morning demonstrations on Clinical Methods and afternoon demonstrations of groups of selected cases. A syllabus will be issued in due course.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

A MEETING of this section of the Royal Society of Medicine was held on June 1st, Mr. W. G. SPENCER, the President, in the chair.

Mr. C. A. PANNETT read a paper on

Treatment of Imperfect Descent of Testicle.

He said that all the present methods of treatment were unsatisfactory, and that in the future treatment would probably be the supply of the missing hormone. Meanwhile, the methods orchidopexy and orchidocœlioplasty were at our disposal, though these were by no means ideal. Mr. Pannett then reviewed the methods of orchidopexy. In arrested descent as distinct from abnormal descent (ectopia) all methods of replacing the testicle in scrotum were ineffective. In a case of Bevan's operation, where the testicle was removed a few days later, sections showed a condition of hæmorrhagic infarct in which all the secretory cells of the testicle were degenerated, the internal secretory as well as the spermatogenic cells. This was a very undesirable result, because the imperfectly descended testicle was ordinarily able to maintain the male characteristics. Mr. Pannett proceeded to the discussion of orchidocœlioplasty, with special reference to experimental study on the rabbit. The results observed in this animal were the disappearance of spermatogenic cells and of their derivatives, but the continued activity of other cells, notably those lining tubules, which in the rabbit probably serve an internal secretory function. No vascular lesions and no obstruction of vas deferens were produced as a result of operation. The curious atrophy of the external secretory function was probably due to loss of the assistance in the evacuation of secretion usually supplied by contractions of the cremaster muscle. The testicle was unique in having a very long and tortuous path between the secreting acini and the excreting duct—the vas. The seminal tubules by themselves had not a sufficiently high secretory pressure to overcome the resistance of the 20 feet winding epididymal tube, when unaided by the compression exercised by the cremaster, which squeezed out the contents of testis and epididymis into vas as from a sponge. The practical deductions which Mr. Pannett drew from his experiments and clinical experience were: (1) that when orchidopexy is impossible orchidocœlioplasty should be performed rather than removal or a Bevan operation; (2) that in order to avoid destroying the possible spermatogenic function of an arrested testicle which might descend later on, operation on uncomplicated cases should be postponed until the eighth or the twelfth year; (3) that a bubonocele was no indication for operation; (4) that indications for operation were attacks of strangulation, torsion, or pain (orchitis from muscle trauma). Mr. Pannett concluded by describing the technique of orchidocœlioplasty.

Discussion.

The PRESIDENT expressed his interest in Mr. Pannett's communication, and emphasised the desirability of careful differentiation between the various conditions described by Mr. Pannett. It was especially necessary to distinguish those cases who would be likely to get a delayed descent at puberty. The possibility of the insidious onset of malignant disease must be borne in mind.

Mr. PHILIP TURNER had now abandoned the fixation operation. Many years ago he had started trying to bring the testicle down to the opposite side of the scrotum. The anatomical results of this procedure were satisfactory. As to the distinction made by Mr. Pannett between imperfect descent and ectopia Mr. Turner considered that no sharp line of demarcation could be drawn between these conditions. Mr. Pannett had alluded to the shortness of vessels as a reason against the operation of orchidopexy. In Mr. Turner's experience this trouble was unusual, but shreds of fascia resembling vessels often had to be defined and divided. Mr. Turner did not interfere with vessels. One advantage of bringing the testicle through a septum was that no sutures are needed—if a small hole is made and the testicle drawn through, the septum contracts and exerts a continuous slight force to prevent the testicle from retracting again. In three out of four cases who returned for examination on request a few years after this operation the testicles were well developed and no sign of the operation was detectable. Of 10 cases written to last year seven responded; of these four showed most satisfactory anatomical results; in two the testicle was either smaller than the other or had risen somewhat, and one case was a failure. The age of election for operation was between 6 to 10. It was preferable to operate before the age of 12, because symptoms—usually attacks of pain due to orchitis—seldom arose before that age. He had operated on adults because they desired it. As to a chemical stimulus some had tried thyroid extract, but inasmuch as a patent processus vaginalis was practically always present, Mr. Turner was sceptical as to the possible value of such treatment.

Mr. MCADAM ECCLES put forward a plea for the use of the term "imperfectly migrated" testicle instead of the expression in common use, since developmentally the testis does not descend. He considered that there was little if any alteration in the replaced testicle, since few had spermatogenic functions to start with, but they did have an internal secretion. In Mr. Eccles' experience cases came up more on grounds of definite hernia than for an imperfectly migrated testis, and if the condition was associated with hernia he was convinced that the testicle should not be drawn down to either side of the scrotum in young subjects, because this treatment would destroy its special function. In cases of double internal migration Mr. Pannett's method was the correct one. The glands should be brought right within the peritoneal cavity, the greatest care being taken not to damage the vessels. In an adult Mr. Eccles always endeavoured to bring down the gland, and in these cases Mr. Turner's method seemed to him the most desirable.

Mr. SPENCER MORT said that Mr. Pannett's idea of the squeezing action of the cremaster muscle appealed to him. He asked about the spermatogenic functions of such animals as the elephant, whose testes were in the abdomen, and the cock whose testes were not external. He suggested that by placing in the abdomen both testes of a healthy buck rabbit, and after a suitable interval mating it with a doe, the question as to whether the spermatogenic functions of the rabbit were impaired by this procedure might be determined.

The PRESIDENT agreed with Mr. Turner that longitudinal fibrous bands had often to be severed.

In reply Mr. PANNETT said that if no hernia and no pain were present there was no reason to operate, but after puberty it was not desirable to leave testes in the canal.

Answering Mr. MORT, Mr. PANNETT said that in the cock the testes do not go right up into the abdomen, but are drawn up into the groin, still retaining some contact with the cremaster muscle.

Dr. A. GOODMAN LEVY read a paper on

Cardiac Massage.

He first discussed the general principles underlying the use of cardiac massage. Its sole function was to create an artificial circulation. The term massage was a misnomer, as it was really an effective rhythmical compression of both ventricles that was required. The hand must have access to the right as well as the left ventricle, and the whole heart must be compressed with the movement used on

the bulb of a Higginson's syringe. As to surgical technique the method described by Bost and Neve[1] appeared to Dr. Levy to satisfy most nearly the required conditions. In this method the attachments of the diaphragm are cut for two inches, through an abdominal incision. The right hand is inserted into the left pleural cavity and the heart grasped outside the pericardium. During massage the parts are pressed round the right wrist so as to prevent air from entering the pleural cavity. Dr. Levy emphasised the importance of performing artificial respiration, preferably by perflation, but artifical respiration performed by Sylvester's method might be sufficient when there was no opening into the pleural cavity, provided it did not interfere with the proper performance of massage. He attached little importance, to variation of the rate of cardiac compression, as the rate bore no relation to that of the spontaneous beat on recovery. But the occasional interruption of massage was desirable since some observers had found that a spontaneous beat developed more readily after a pause. The limit of the interval between the occurrence of syncope and the commencement of massage depended mainly on the length of time during which the nerve centres could stand deprivation of blood. If the interval were too long severe nervous symptoms, such as tetany, rigidity, incontinence of urine, and cerebral irritation, followed the restoration of the circulation. The generally accepted limit was five minutes. As to posture partial inversion was desirable only in so far as it assisted cerebral circulation and the filling of the heart chambers. Dr. Levy then proceeded to the separate consideration of (1) syncope from overdosage, and (2) primary cardiac syncope. In the former condition artificial respiration alone was usually sufficient to restore the heart beat, but if it had not been applied early enough cardiac massage was called for. In cats Dr. Levy had found the latter uniformly successful. Adrenalin was recommended by Gunn and Martin,[2] but Dr. Levy considered it unnecessary, and in the presence of low blood pressure even dangerous. In this case pituitary extract should be injected. In primary cardiac syncope spontaneous recovery sometimes occurred, but experimental evidence in cats showed that in these animals it occurs only within the first 1½ minutes. Dr. Levy deduced from experiments that not more than two minutes should be allowed for the chance of spontaneous recovery, and cardiac massage, with intermissions, should be attempted. The duration of massage required varied from one to 48 minutes in a series of 29 cats in which ventricular fibrillation had set in.

Discussion.

Mr. MORT said that he had found by opening the radial artery that forcible pressure in the lower thorax in the course of artificial respiration caused an intermittent flow of blood as great as direct massage of the heart from the abdomen.

The PRESIDENT asked if any case had been known to recover after massage of the heart through a hole in the diaphragm into the left pleural cavity.

Mr. LEVY replied to this question in the affirmative.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

EXHIBITION AND REPORTS OF CLINICAL CASES.

A MEETING of this Section of the Royal Society of Medicine was held on May 27th, Dr. F. S. LANGMEAD, the President, being in the chair.

Dr. J. H. THURSFIELD contributed the notes of a case of

Renal Calculus.

The patient, a girl aged 10 years and 2 months, had been admitted to hospital with a history of recurrent hæmaturia for eight months. There had at times been œdema of the feet and face, and on admission the right ankle was swollen. The urine contained blood, albumin, and blood and epithelial casts. Systolic blood pressure was 124. The heart was not hypertrophied. While the patient was confined to bed the œdema disappeared, but the urine still contained traces of blood. The urine was passed freely in fair quantity and there was no pain. A tentative diagnosis of nephritis was made, but as the bleeding continued and a few pus cells were found in the urine, the latter was examined bacteriologically and found to be sterile. She was then given 15 c.cm. of normal horse serum, and nine days later reacted with a typical macular rash, fever to 99° F., and some reduction of urine, which contained more blood and pus. The diagnosis of nephritis became doubted, especially as a tumour, thought to be a displaced right kidney, could be felt low down on the right side of the abdomen. At this time there was but little hæmaturia and the child was placed on a more liberal diet, and encouraged to get about the ward. The result was an attack resembling uræmia, with scanty urine, hæmaturia, vomiting, headache, and collapse. The hands were in the characteristic tetany position. She recovered and was skiagraphed soon afterwards, the skiagram showing a doubtful calculus on the right side low down. A urea-concentration test indicated that the excretion appeared to be somewhat delayed. Cystoscopy showed that the right ureteric orifice was normal, the left somewhat dilated. A second urea-concentration test demonstrated decided increase of excretion. Tubercle bacilli were now reported in the urine, but four subsequent examinations failed to confirm their presence. By this time the constant presence of the tumour had convinced Dr. Thursfield of the desirability of an operation, and to facilitate the diagnosis further, oxygen was injected into the peritoneal cavity and a skiagram taken. The resulting pictures showed quite clearly a large tumour with the circular shadow, previously noted, within it. Mr. O. Addison operated and extracted a calcium oxalate calculus from the dilated and thickened pelvis of the right kidney. There was no evidence of tuberculosis and no enlarged glands could be felt in the peritoneal cavity. Her recovery was slow, delayed by vomiting and a considerable amount of hæmaturia, but in the course of a fortnight this improved and the child began to put on flesh rapidly.

Dr. J. PORTER PARKINSON showed a case of

Symmetrical Gangrene (? Raynaud's Disease).

The patient, a female child aged 3 years, was the second illegitimate child of an apparently healthy mother aged 25 years. The mother's statement was as follows: The infant had always been healthy, but suffered from chilblains at Christmas; these became swollen and blue in March, and began to discharge a thick yellow matter from the toes of both feet. The sores would dry up and then appear again when the child wore shoes. The toes began gradually to fall off and were found in the dressings. The child was well nourished but small. The Wassermann reaction was negative. The outer three toes of the left foot had disappeared, leaving round sores which had now healed. All the toes of the right foot were missing and the foot was much swollen and very tender, the skin being purple in colour as far as half-way up the leg. This colour had since gone and the swelling was much less. The heart, lungs, abdominal organs, and urine were normal.—Dr. THURSFIELD said that he regarded syphilis as the usual cause of symmetrical gangrene and Raynaud's disease, like hæmoglobinuria, when it occurred in children, as always syphilitic. He asked whether a Wassermann reaction of the mother's blood had been done, as members must all have seen cases of indubitable hereditary syphilis in which the patient's blood was persistently negative.—Dr.

[1] THE LANCET, 1918, ii., 552.
[2] Journal of Pharmacology and Experimental Therapeutics, 1915, vii., 31.

PARKINSON replied that no opportunity had been afforded to test the mother's blood. He quite agreed as to the frequency of a syphilitic origin for Raynaud's disease and also hæmoglobinuria, and referred to a family group of cases of the latter disease in which syphilis was shown to be the cause.

Mr. PHILIP TURNER showed a case of

Tumour of the Left External Ear.

It was soft, non-fluctuant, and situated chiefly behind the ear, and recently had been increasing in size, so that it occluded the external auditory meatus, rendering the girl deaf unless she cleared the meatus by traction on the pinna. Recently there had appeared also a swelling over the parotid, and a similar soft tumour of the scalp in the occipital region. One or two hard nodules could be detected imbedded in the tumour. A coarse growth of hair had appeared over the anterior part of the swelling. Mr. Turner regarded the tumour as almost certainly a nævo-lipoma and the harder nodules as foci which had undergone fibrosis. Because of the increase in size, and the blocking of the external auditory meatus, he proposed to attempt to remove it.

The PRESIDENT showed a case of

Cirrhosis of the Liver with Splenomegaly.

For about six months the patient, a girl aged 9 had been ailing, but since the end of April had been worse, complaining of abdominal pain. Blood had been passed with every stool during the first fortnight of more severe illness, and there were also oozing from the gums and epistaxis. Vomiting was occasional. Jaundice of fair severity appeared. On admission early in May, in addition to the jaundice, a few telangiectases were noticeable on the face. The gums continued to ooze slightly. There were some dilated veins in the flanks. In the epigastrium the liver could be felt enlarged, hard, and nodular. The spleen was also enlarged, reaching below the costal margin for about two fingers-breadth. It varied considerably in size and was not hard. After admission slight ascites developed. The cervical and axillary glands were slightly enlarged. Nutrition was good. The jaundice lessened and hæmorrhages diminished after admission. Wassermann reaction negative on two occasions. The urine was normal, containing neither bile pigment nor salts, but was not examined until the jaundice had begun to lessen. A blood examination gave the following results: red blood cells, 4,700,000; Hb, 74 per cent.; colour index, 0·78; white cells, 5500, consisting of polymorphs, 69 per cent.; small lymphocytes, 22 per cent.; large lymphocytes, 5 per cent.; eosinophiles, 2·5 per cent.; large hyalines, 1 per cent.; basophiles, 0·5 per cent. A week later the red blood cells fell to 4,400,000, the hæmoglobin to 66 per cent., and the white cells to 3000. The diagnosis lay between primary cirrhosis, with secondary splenomegaly and Banti's disease. In favour of the latter was the leucopenia. He thought, however, that true Banti's disease—i.e., the combination of splenic enlargement, anæmia, hæmorrhages, and cirrhosis of the liver, with ascites—was extremely rare in young children, much rarer than primary cirrhosis. The occurrence of telangiectasis was a prominent feature of hepatic cirrhosis in children and he favoured that diagnosis.—Dr. THURSFIELD said that many of the cases described as splenic anæmia and Banti's disease in children did not conform to type and present the features which he regarded as essential to the diagnosis. The softness of the spleen in this case was against the diagnosis of Banti's disease and in favour of congestion secondary to primary cirrhosis. The appearance, too, in Banti's disease he considered characteristic, whilst this patient looked too well. Cirrhosis of the liver possibly might be due to an acute infection. An epidemic of fatal cirrhosis had occurred among the deer of Richmond Park, which certainly suggested an infective origin. Gaucher's family splenomegaly had also to be considered in the diagnosis—The PRESIDENT, in reply, agreed with Dr. Thursfield's remarks concerning splenic anæmia. The softness and variability of the spleen, he thought, was against a diagnosis of Gaucher's disease.

The PRESIDENT also contributed the notes of a case of

? Cerebro-spinal Fever.

The patient, a boy aged 13½, towards the end of February had suffered from pains in the limbs and had developed an eruption of the skin, regarded by the doctor who saw him as erythema nodosum. There were no joint swellings. After an interval of about a week he complained of severe paroxysmal pains in the head, radiating from the temporal region sometimes to the occipital region, sometimes to the forehead, and sometimes to the neck and shoulders. These attacks recurred every few days and were accompanied by fever, gradually rising higher with each attack, and sometimes by vomiting. With the attack there was considerable irritability, the boy being restless and disliking manipulation; there was no head retraction. Between the attacks he was quite at ease and had a good appetite, and physical examination showed no other abnormalities than slight rigidity of the legs, weak knee-jerks, loss of weight, a slight mitral systolic bruit, and slight tenderness over the left kidney, which appeared unduly easily palpable. There had been no urinary changes, but in view of the poverty of physical signs and the palpability of the kidney, it was thought advisable to have the urine examined bacteriologically; it was reported upon as containing *B. lactis aerogenes*. Neither alkalis nor urinary antiseptics caused any improvement, and the boy was admitted to hospital, the attacks becoming more severe and prostrating during the interval of one week. During the first bout of fever after admission the temperature rose to 105° F. Thereafter the attacks of headache and fever occurred every 48 hours for 17 days, the temperature ranging from 92° to 105°, and the chart resembling closely that of benign tertian malaria. Examination during the attacks revealed always restlessness, general hyperæsthesia, flushing, and rigidity of the legs, whilst sometimes there were vomiting, ptosis, and slight squint. The urine remained normal and a second bacteriological examination showed it to be sterile. Radiographic examination of the abdomen was negative. The cerebro-spinal fluid was under slightly increased pressure and contained 6500 white blood cells per c.mm., chiefly polynuclears. Culturally it was sterile on two occasions, nor were organisms seen in a film after centrifugalisation. A blood culture gave negative results, as did also examination for malarial organisms. There was a leucocytosis of 23,000, 90 per cent. of which were polynuclears. Ophthalmoscopic and otoscopic examinations were negative. An agglutination test, using the cerebro-spinal fluid against strain II. of the meningococcus showed no trace of agglutination. Complement-fixation test for tubercle, using the blood serum, was also negative. Quinine failed to modify the fever. After this period the febrile attacks became more occasional. On one occasion he complained of numbness in the left forearm and left leg, and partial anæsthesia was demonstrable in these positions, but gradually disappeared within a few days. A final lumbar puncture was done 21 days after admission, the fluid escaping under considerable pressure. Since then there had been no further rise of temperature and the boy was now convalescent. The knee-jerks were still difficult to obtain and there was nystagmus. In view of the increasing intrathecal pressure, the high polynuclear count in the cerebro spinal fluid, and the negative findings by other examinations, the case was regarded as probably one of cerebro-spinal fever in spite of the negative bacteriological examination of the cerebro-spinal fluid and almost complete absence of signs between the attacks, which resembled the crises encountered in that disease.—Dr. E. A. COCKAYNE agreed with the

diagnosis and referred to a case in which, after the appearance of a rash resembling somewhat erythema nodosum, there were four days of complete intermission of symptoms, followed by definite cerebro-spinal fever, which proved fatal.

SOCIÉTÉ DE THÉRAPEUTIQUE DE PARIS.

AT a recent meeting of this Society Dr. ARTAULT DE VEVEY read a paper on

The Treatment of Scabies and Pediculosis by Benzine,

in which he stated that though the parasiticide properties of benzine were well known to naturalists, especially entomologists, they were not generally recognised by the medical profession. He had frequently found that a garden syringe filled with benzine was sufficient to rid a house of ants, beetles, and cockroaches. In the case of scabies, treatment consisted in swabbing the regions affected with benzine, and applying at night an ointment composed of 10 g. of benzine with 50 g. of lanoline, and covering it with wool. The following morning the ointment was washed off with soap and a cure was effected. The body-linen and clothes were disinfected by sprinkling them with benzine, and putting them in a closed chest for a few hours. In pediculosis capitis the scalp was swabbed with benzine, and the head covered with a paper or cloth cap for an hour. Not more than 10–15 c.cm. of benzine need be used. In the case of body-lice the axillæ, groins, and flexures of the limbs should be swabbed, and the clothes and linen treated as in the case of scabies. The only danger, which could easily be avoided, was the inflammability of benzine. The applications were never painful, except over excoriations.

The Treatment of Laryngeal Tuberculosis by Rare Earths.

Dr. G. ROSENTHAL in his paper stated that this treatment must be both local and general. General treatment consisted in giving an intravenous injection three times a week of 4 c.cm. of a solution of didymium sulphate, at first in a 2 per cent., and later in 4 per cent. strength, together with 5–20 c.cm. of concentrated solution of saccharose. Local treatment included (*a*) progressive intratracheal injections of from 2–15 and 20 c.cm. of 1 in 10 gomenol oil, supplemented by 2 cg. of didymium sulphate; (*b*) local applications of the preparations already mentioned, or one of the following solutions: sulphate of didymium 0·02 g., gum arabic q. s. ad 4 c.cm., or novocaine 0·02 g., didymium sulphate 0·02 g., gum arabic q. s. ad 4 c.cm. The only contra-indication to local treatment was weakness of the patient. Great care should be taken in giving intravenous injections in febrile cases.

Dr. R. HUERRE read a paper on

Cedar Wood Oil as a Substitute for Sandalwood Oil,

in which he stated that the chemical composition of cedar wood oil, which contained sesquiterpenes and sesquiterpenic alcohols, showed that it was in no way inferior to sandalwood oil in its action on the mucous membranes.

The Phosphorus and Calcium Balance in Tuberculosis.

Dr. R. LAUTIER in his paper recorded cases showing that, though a nitrogenous deficit or retention was generally accompanied by a deficit or retention of calcium, this was not a universal rule. In like manner the nitrogen balance and phosphorus balance did not always go hand in hand. In order to obtain the best conditions of nutrition or repair, food or drugs containing phosphorus or calcium should not be prescribed haphazard, but should be given in such a way that there should be a slight excess of calcium.

The Treatment of Whooping-Cough by Adrenalin.

Dr. L. DUMONT in his paper stated that this method, which was introduced by an English writer in 1912 or 1913, had been employed by him with constant success since 1913. His dosage was as follows, a 1 in 1000 solution of adrenalin being employed: below 3 years, 2 drops three times daily; from 3 to 7 years, 3 drops every three hours; from 7 to 15 years, 4 drops; above 15 years, 5 drops. The doses must be taken immediately after the paroxysms, so as to prevent the drug being vomited. If no improvement occurred in three days' time, the dose must be increased by one drop daily until a real improvement took place. An attack so treated should not last longer than two to three weeks.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES.—The business meeting of the General Council will be held on Tuesday, June 28th, at 3 P.M., at the Morley Hall Y.W.C.A., George-street, Hanover-square, London, W. The business meeting will be followed by the annual general meeting.

Reviews and Notices of Books.

AN INTRODUCTION TO THE PSYCHOLOGICAL PROBLEMS OF INDUSTRY.

By F. WATTS. London: George Allen and Unwin, Ltd. 1921. Pp. 240. 12*s.* 6*d.*

THERE is to-day a vogue for things psychological, and another for things industrial. The book now before us is concerned with both.

The author starts by proclaiming the need that exists in industry for investigating the human side of work, and for scientific methods "to collect the facts, to arrange them, and to attempt to explain them." When pointing to the underlying influence exerted by the ductless glands upon the emotions he even tempts the reader to expect a physiological explanation of psychology; thus, the effect of emotional excitement upon the adrenal glands, which leads to increase in the rate and force of the heart-beat and promotes effective muscular innervation, is claimed as a factor in industrial fatigue. Fatigue, its onset and elimination, is dealt with at some length, but the subject is treated in too abstract a manner, a not unusual failing with psychologists who write of industry; there is little appeal to facts, of which there are to-day plenty accumulating, small effort to arrange them, but a vast deal of theoretical disquisition and a priori deduction. The section devoted to vocational selection is perhaps the best in the book, although here, too, there is little evidence of real investigation. Attention is well drawn to the need in industry for economical route-ing of human ability, just as there is an economical route-ing of processes; "economy suggests it; humanity demands it." The criticism is particularly applicable to the last half of the book. Here appeal to carefully collected data is thrown to the winds, and theoretical psychology rules supreme. Monotony, for instance, is discussed without establishing by results that any such thing really exists; surely, processes could have been found and instanced, similar in the amount of physical exertion required, in the conditions of labour, in the wages paid, and in other pertinent factors, but differing in the variety of movement called for in the one case and the constant repetition work in the other; observations could then be quoted to establish how important this question of monotony really is, and then would be the time, if at all, to build up a superstructure claimed to be the framework of industrial unrest. We fully allow that by adopting the method pursued an interesting and readable book can be written, and in producing such a book Mr. Watts has succeeded. The pity is that the reader has to disentangle ideas based on fact from those based on some general consensus of opinion. The author has allowed himself rather too many footnotes, which have well been called indications of lazy writing. References to authorities quoted are irregularly dealt with, appearing now in footnotes, now (where they always should appear) in a list at the end of the chapter; here is another indication of slackness in preparation. The index of the book is quite inadequate, and hardly supplements the statement of contents.

We can recommend this book to those who desire to acquaint themselves with the interesting thoughts of an interesting thinker, but we are unable to promise them a solid contribution to the science of the subjects dealt with therein.

ANNALS OF MEDICAL HISTORY.

Vol. III., No. 1. New York: Paul B. Hoeber. 1921. Pp. 96. $2.50.

THE previous volumes were interesting, and the number now before us is no exception to the pattern. Among the papers of chief note is one by Isador H. Coriat, dealing with an ancient Eyptian medical

prescription for hysteria to be administered either by fumigation or internally. It consisted of semi-precious stones together with wine and certain plants. It was apparently found efficacious, but still we prefer the simple methods of our more immediate ancestors quoted by Sir D'Arcy Power in his Annual Oration (1920) delivered before the Medical Society of London.[1] Circa 1670, the Rev. John Ward, vicar of Stratford-on-Avon, wrote in his diary concerning the practice of a neighbouring medical man: "Dr. Trig cured a woman yt was troubled with histerical fits this way; he laid her upon ye ground with her face downwards, yn took up her coat and gaue her 3 or 4 good slaps on ye arse, and they cured her."

Another notable paper in the Annals is by Henry Barton Jacobs on Elizabeth Fry, Pastor Fliedner, and Florence Nightingale, all of whom brought about enormous improvements in nursing the sick. Pastor Fliedner was the founder of the Deaconess Hospital, Kaiserwerth. John C. Hemmeter contributes an interesting article upon Leonardo da Vinci as a Scientist, and Harry Friedenwald discusses the giving of medical degrees in the Middle Ages by other than academic authority; references are given to the granting of medical degrees to Jewish physicians by the Pope, in 1402 and also in 1502. We can call two instances to mind not mentioned by Dr. Friedenwald of degrees being granted without academic authority in much later times. In 1657 the poet Cowley, "complying with the men then in power (which was much taken notice of by the royal party), he obtained an order to be created Doctor of Physic, which being done to his mind (whereby he gained the ill will of some of his friends) he went into France again. . . ." This occurred in December, 1657, at Oxford. Again even to day "Lambeth Degrees" in every faculty are or can be granted by the Archbishop of Canterbury, a remaining privilege of His Grace's former position as Papal Legate.

TYPES OF MENTAL DEFECTIVES.

By MARTIN W. BARR, M.D., Chief Physician, Pennsylvania Training School for Feeble-Minded Children; and E. F. MALONEY, A.B., Professor of English, Girard College. London: H. K. Lewis and Co., Ltd. 1920. Pp. 180. 16s.

As the title suggests, this book is a study of a series of cases illustrating the various grades and specialised types of mental deficiency. The authors' aim that the cases should be "sign-posts pointing the way to successful diagnosis" is certainly achieved, for the grading standard is well maintained, the notes on hereditary and environmental conditions are illuminating, and the descriptions of general intelligence, behaviour, and educability of each case give clearly outlined clinical pictures. The absence, however, of any record of examination by the newer psychological methods is a somewhat notable omission in a book on this subject, especially in one which emanates from America. Unfortunately for English readers the grading is not that to which they are accustomed, for Dr. Barr still refuses to use the term "feeble-minded," or even its American equivalent, "moron," for the higher grades, and classifies his cases as "idiots, idio-imbeciles, and imbeciles (low, medium, and high-grade)." His medium and high-grade imbeciles, however, practically correspond to our feeble-minded. This more extensive application of the term "imbecile" makes the use of the term "moral imbecile" less of an anomaly than it is in the English nomenclature, but Dr. Barr's classification is not likely to be adopted here, partly on sentimental grounds and partly because the Mental Deficiency Act has definitely fixed our terminology.

On the subject of moral imbeciles there is still much confusion of thought, from which this book is not quite free. For after speaking of "perversion, or complete absence of the moral sense," as a characteristic of this type, Dr. Barr quotes two cases who could "undoubtedly discriminate between right and wrong," and another who realised that his punishment was deserved. And, as the great majority of the examples cited are, from the descriptions given, obviously deficient in intelligence and therefore certifiable under one or other of the grades already mentioned, one is reminded of Healy's dictum, in speaking of the moral imbeciles, that he had "not found one." Of much interest is the chapter on "idiots savants," those curious types who compensate for their general deficiency by a special talent in one or more directions. One of the cases described has been made familiar to English readers by Dr. Tredgold, who, however, regards the case as one not of primary defect, but of secondary defect, due to deafness. Another of Dr. Barr's cases is of extreme interest as showing how the discovery and encouragement of a specific talent caused definite improvement of behaviour and an interest in other work which six years of previous training had failed to produce. From the point of view of operative treatment, the case of a lad who, after castration at 14 years of age, showed greater capacity for training and marked increase of control over his baser instincts, is of some importance. A photograph is given of every case, an unusual and valuable feature, but it has apparently necessitated the reduction of many to a size incompatible with clear definition. It is scarcely possible, for example, to find a Darwinian tubercle in a photograph of head and shoulders the size of a postage-stamp.

The book is well worth careful study by all who have the responsibility of diagnosis of such cases.

TRAITÉ PRATIQUE DES MALADIES DES ENFANTS DU PREMIER AGE.

By GASTON VARIOT, Médecin de l'Hospice des Enfants-Assistés et de l'Hôpital Notre-Dame du Perpétuel-Secours, Chef des Services de l'Institut de Puériculture, President-fondateur du Dispensaire Goutte de Lait de Belleville. Paris: Octave Doin. 1921. With 88 figures. Pp. 1150. Fr.75.

Dr. Variot's new text-book includes a study of the diseases of infants in the first two years of life. The early chapters are devoted to the very important subjects of infant hygiene and infant feeding, on which the author can speak with authority. There is an elaborate consideration of the diseases of the digestive system, with a special chapter on congenital anomalies. Respiratory, cardio-vascular, and nervous systems are treated in turn, and are followed by detailed consideration of congenital syphilis, tuberculosis, specific fevers, rickets, dystrophies, and so forth. The work is essentially personal, and is the fruit of a long career of careful clinical and laboratory study of disease in early childhood. It reads easily and never becomes dull, though it is a most complete treatise on the diseases of infants—in fact, an exposition of the modern teaching of the French school in the matter of infant hygiene and disease.

RATIONAL TREATMENT OF PULMONARY TUBERCULOSIS.

By CHARLES SABOURIN, M.D., Medical Director of the Durtol Sanatorium, France. Authorised English translation from the sixth French edition. Philadelphia: F. A. Davis Company. 1921. Pp. 440. $3.50.

THE author who would write a book devoted solely to the treatment of pulmonary tuberculosis must take his courage in both hands, for he has to run the gauntlet of the hundreds of advocates of various remedies, and he is certain to please few unless he is prepared to give his book encyclopædic dimensions. The present work does not attempt to discuss the latest "advances" in the specific treatment of tuberculosis, and only a page is devoted to vaccine- and sero-therapy. Many other comparatively modern forms of treatment are either wholly

[1] THE LANCET, 1920, i., 1043.

ignored or discussed with a brevity that may be taken as the measure of Dr. Sabourin's estimate of their value. He is a sanatorium physician with long and varied clinical experience, and it is evident that he is either ignorant of the enormous amount of new therapeutic work, or that he has found it profitless. His book thus conveys nothing new. But it would be difficult to over-estimate the value of the sound and practical clinical advice he has to give. In almost every page he shows a profound and intimate knowledge of the workings of the tubercle bacillus in the human body and of the many steps which can be and ought to be taken to make the reaction of the host to the parasite victorious. With regard to exercise he is emphatic that it should be aimed mainly at the lower limbs, for the arms are located too near to the lungs to be used freely with impunity by the consumptive. Thus he advocates walking as the most useful form of activity, and he regards sawing wood, even if it be for 15 minutes only, as "highly detrimental." His advice with regard to coughing shows the same sympathetic knowledge of his subject, and he contrasts the unrestrained indulgence in coughing by the untrained patient with the coughless silence of a sanatorium dining-room. The author of the tag—

> "It's not the cough that carries you off,
> It's the coffin they carry you off in,"

was more witty than wise, for many a patient coughs himself into his grave who, had he learnt to discipline this reflex, would still be a useful member of the community.

MEDICINE IN VIENNA IN THE PAST.

Das alte medizinische Wien in zeitgenössischen Schilderungen. Von Dr. Med. et Phil. MAX NEUBURGER, O.Ö. Professor für Geschichte der Medizin an der Universität zu Wien. Wien und Leipzig: Moritz Perles. 1921. Mit 9 Abbildungen. Pp. 266. M. 35.

THIS account of the medical side of Vienna from contemporary records comprises the period from the death of Gerhard van Swieten in 1772 to 1814, the year of the Congress of Vienna, a period when Vienna was the Mecca of the medical pilgrim, and when "Es war nur *ein* Wien." But much has happened since then. G. van Swieten, one of the famous pupils of the illustrious and then all-powerful H. Boerhaave, of Leyden, was called by Maria Theresa, Empress of Austria, to become her physician and to reorganise medical studies in Vienna and in the Austrian Empire generally, which he did with gratifying success, carrying with him the doctrines and methods of the Leyden School. Anton de Haen was brought from the Hague by van Swieten to assist. An account is given of what is called two sensational events in the history of Vienna Medicine—the opening of the General Hospital, with its adjuncts—for maternity cases, also for foundlings, lunatics, and incurables in 1784, and the foundation by Joseph II. of the K.K. Medico-Chirurgical Academy in 1785.

The text is composed of extracts from reports by medical men—German, French, Russian, and English—who visited Vienna and in their travels described what they saw in the hospitals and medical school. The mortality of the "foundlings" seems to have been appalling; one surgeon treated his cases with water dressing and no bandages or plasters even to hold the linen covering in position, another extols plasters and salves; one physician was all for expectant treatment, and others adopted vigorous methods, so that there was plenty of variety in treatment for observation and criticism. We get glimpses of the activities of Störck, Stoll, Plenck, Peter Frank, and others famous in their time; of Mesmer, with his Animal Magnetism, who found fewer fools in Vienna than in Paris; of cases diagnosed into two classes, sthenic and asthenic, and treated accordingly; of the famous oculist, then of European reputation, von Beer; of G. Prochaska, with his wonderful collection of injected anatomical specimens, and some of the original preparations of Lieberkühn; of Gall and his doctrine, and his public lectures in 1786, which, however, were suppressed. We hear of the terrible epidemic of typhus in Vienna after the battle of Austerlitz in 1805, of a visit by K. Ernst von Baer and his impressions. We are reminded, also, of a forgotten incident in the life of Richard Bright by a reference to "Travels from Vienna through Lower Hungary, with some remarks of the State of Vienna during the Congress in the Year 1814." Here we get a picturesque account of De Carro's introduction, advocacy, and practice of Jenner's methods of the cowpox inoculation against small-pox. Bright also notices that of the most celebrated practising physicians scarcely one is an Austrian by birth.

There is much to interest the reader in these studies of the practice and doctrines, as well as the personalities, of a by-gone age in medical history.

CLINICAL STUDY AND TREATMENT OF SICK CHILDREN.

Third edition, revised and enlarged. By JOHN THOMSON, M.D. London and Edinburgh: Oliver and Boyd. 1921. Pp. xxxii.–877. 32*s.* 6*d.*

Dr. Thomson brings to his work the outlook of a scientific observer as well as of a clinician, and over and above his acquaintance with disease in children has an inspiring knowledge of the literature of the subject. The only criticism that can be offered is that, doubtless from considerations of space, Dr. Thomson has too often limited himself to a mere recapitulation of symptoms when fuller discussion and expression of his personal views as to their interpretation would have been welcome. Different parts of the book will necessarily appeal to different readers. The opening chapters, dealing with methods of examination of the sick child and with symptoms and signs peculiar to children, will be found especially valuable by the student. Physical constants, and the variations to which growth and development are liable in health and disease are treated comprehensively, and the diet and general hygiene of the infant and adolescent are not neglected.

Certain of the views expressed are not those most generally accepted. For the breast-fed infant, supplementary feeding is advocated in cases where the supply of breast-milk is insufficient. The balance of opinion in England appears to favour alternate feeding as being both more easy to carry out, especially in working-class homes, and on the whole more beneficial both for mother and child. The chapters on rickets and scurvy are brought well up to date; a table of the composition of infant foods is of special value (pp. 162–166), the criticisms of the properties of each foodstuff being pertinent. A chapter is devoted to congenital hypertrophic pyloric stenosis, illustrated by reproductions of photographs which compare favourably with any hitherto published, though this rare condition hardly merits the attention devoted to it. The nutritional diseases of infancy are dealt with at length, and the exposition and discussion of Finkelstein's work on food disorders is particularly illuminating. Dr. Thomson would appear to incline more strongly than do most authorities to Finkelstein's theories, that dietetic errors, particularly improper quantitative relationship between protein, fat, and carbohydrate in the feeds, rather than bacterial infection, are responsible for digestive disorder and its sequela marasmus.

The chapters on child metabolism we have found the most interesting in the book. The causation and treatment of tetany and the nervous manifestations of rickets are treated in a chapter headed "Spasmophilia," while an exhaustive study of cyclic vomiting is placed in the chapter on acetonæmia. The ætiology and treatment of asthma in childhood includes a description of the protein-sensitive tests, and the subject of anaphylaxis receives further attention in Appendix C. As regards the application of organic compounds of arsenic to the treatment of congenital syphilis, Dr. Thomson seems

rather more optimistic as to the results of treatment of the later manifestations than are most observers. The relative prevalence of the bovine type of infection in Edinburgh in contrast to the greater frequency of infection with human-type tubercle bacilli in London is discussed. Under existing conditions the boiling of milk is strongly advocated. An apparent contradiction appears on p. 774. After admitting the soundness of the investigations of Ghon and others, who showed that a primary lesion may always be found at the point of invasion of a tissue such as the lung by tubercle bacilli, the lymphatic glands at the hilus being secondarily infected, the author states "in early childhood there is a greater tendency for the lymphatic glands to be severely affected, and it is only when this first line of defence is broken down that the disease is able to reach the lungs." The contention of Ghon was that pulmonary disease reached the lung directly by the air-passages in children as in adults; and that infection of the lungs by continuity of lymphatic paths was unlikely to occur. Dr. Thomson advocates tonsillectomy in cases of tuberculous infection of glands in the neck; he does not devote much attention to the important group of children who show delayed or even complete failure of resolution after broncho-pneumonia, nor to those who suffer from recurrent broncho-pneumonic attacks of catarrh: a warning that these conditions are too frequently diagnosed as juvenile pulmonary tuberculosis might have been helpful to his less experienced readers.

This edition, like its predecessors, is well produced. A comprehensive index and many beautiful illustrations are provided, and the appendices include a Children's Pharmacopœia.

SUGGESTION AND AUTO-SUGGESTION.

A Psychological and Pedagogical Study based upon the Investigations made by the New Nancy School. By CHARLES BAUDOUIN. London: George Allen and Unwin, Ltd. 1920. Pp. 288. 15*s*.

IT is well, at the present time, that the attention of psychotherapeutists should be recalled to the efficacy of suggestion in the treatment of certain morbid states. Before the war a small band of enthusiasts, in this country and other countries, made use of suggestion, with or without hypnosis, in the treatment of functional disorders, and often succeeded in alleviating conditions which had resisted all other methods. Sometimes cures could be recorded, though sometimes claims in this direction had to be turned down. During the war the limitations of suggestion were forcibly impressed upon those medical officers who, often without much previous experience, employed it in the treatment of "shell-shock," and the need felt for some more "rational" therapy, together with the gradual assimilation of some of the doctrines of the psycho-analysts, led in time to a hybrid form of treatment which was neither suggestion nor psycho-analysis. Since the war the tendency would seem to be towards the employment of some form of mental analysis in every case in which psychotherapy is indicated, and the use of suggestion appears to be falling into disrepute. Baudouin's book is therefore opportune in that it serves to remind us that suggestion has still a useful part to play in psychotherapeutics.

The doctrines expounded by him are based on work carried out by Emil Coué at Nancy during the past 10 years. These doctrines are a natural development—indeed, almost an inevitable development—of the views put forward by Liébeault and Bernheim many years ago. Their main feature is the insistence on the importance of auto-suggestion and of the part it plays in all effective suggestion whatsoever. The truth of this has been felt by many who have used suggestion extensively in therapeutic practice; and, indeed, apart from the possibility of some supernormal influence exercised by the hypnotist on his patient, it is obvious, to quote Frederic Myers, that when a subject is told not to feel an aching tooth, "we cannot credit the doctor with doing more than set in motion some *self-suggestive* machinery by which the patient cures his toothache himself." But although the central feature of Coué's doctrines is not new, what *is* new and valuable in Baudouin's exposition is the formulation of the laws and mechanisms through which auto-suggestion works, and the precise description of the most effective ways of bringing them into action.

Perhaps the most important law discovered by Coué is that which Baudouin calls the "Law of Reversed Effort." It is the law exemplified in the attraction which a bunker has for the novice at golf, or a big stone on the road for the budding cyclist. In Coué's words: "When the will and the imagination are at war, the imagination invariably gains the day." It is on the proper appreciation of the relation between the imagination and the will that success in the use of suggestion mainly depends, and a study of Prof. Baudouin's book, in which this topic is fully dealt with, cannot fail to be of great value to the practitioner.

Throughout this work there are numerous references to psycho-analysis, and apparent acceptance of its teachings; but attempts to relate these teachings to those of the new Nancy School are few, and not very successful. Especially is it noteworthy that the writer avoids any discussion of the outstanding contribution of psycho-analysis to the psychology of suggestion—namely, the relation of suggestion to "transference." But it is not surprising, and perhaps not regrettable, that in an essentially practical book certain theoretical problems, which are hardly yet ripe for settlement, should be passed over without comment.

ŒDEMA AND NEPHRITIS.

A Critical, Experimental, and Clinical Study of the Physiology and Pathology of Water Absorption in the Living Organism. Third edition. By MARTIN H. FISCHER, M.D. New York: John Wiley and Sons, Inc. 1921. Pp. 922. 55*s*.

THE third and enlarged edition of Dr. Martin Fischer's well-known work contains the same material as the two previous editions, practically unaltered, and also several important additions. The author develops his conception of the hydrophilic colloid in further detail and gives an account of new experiments on the swelling, and solution of gelatin in non-acid media. Another new feature of this edition is a discussion of the nature of the increase and decrease in hydration capacity of the proteins and a more general discussion of the essential nature of water secretion, while some interesting experiments are added on the behaviour of protein colloids in the presence of buffer mixtures. Much of the book has a direct clinical interest, and the relation of chronic interstitial nephritis to chronic parenchymatous nephritis on the one hand, and to arteriosclerosis on the other hand, is discussed from the point of view of acid-intoxication of the respective tissues. The bias of Dr. Fischer's views is well illustrated by his statement that "any means which leads to an increased production or accumulation of acid in the kidney is a means of "producing nephritis"; and again, in the classification of the several forms of nephritis, in his statement that "there is but one form of nephritis—parenchymatous nephritis." No succinct definition of nephritis is given; the author says that he uses the word in its ordinary clinical sense and yet he seems to regard the albuminuria that follows hard physical exertion as evidence of nephritis. Another word that requires more exact definition is "acid-intoxication," for the ambiguous sense in which acid-intoxication is used has led to the assumption that it means hydrogen-ion concentration. The book would be improved for the general reader if a chapter were added dealing with this fundamental question and defining the differences between acid-intoxication, hydrogen-ion concentration and titration acidity. The subject would be further

simplified if it were possible to measure the degrees of acid-intoxication in the body tissues. This is, however, an enormously difficult matter, since alkalies and other substances in addition to acids may increase the hydration capacity of colloids.

If the reader is content to leave such matters as these wrapped in mystery he will yet be interested in the clinical aspect of the author's views; he may, in fact, be prepared to judge them on the success attained in the treatment of œdema and nephritis on the lines that Dr. Fischer lays down.

TUBERCULOUS SALPINGITIS.

A Clinical Study of 200 Cases. By J. P. GREENBERG. The Johns Hopkins Hospital Reports. Vol. XXI., Fasc. 2. Baltimore: The Johns Hopkins Press. 1921.

THIS monograph is based upon an analysis of all the cases of tuberculous salpingitis which occurred in the gynæcological service of the Johns Hopkins Hospital during the years 1890–1919 inclusive. The author found that this condition was present in nearly 1 per cent. of all women admitted to the gynæcological service, and that of every 13 abnormal tubes removed by operation one was tuberculous. It occurs most commonly in young sterile women, of whom one quarter had pulmonary tuberculosis. The chief symptoms are abdominal pain and leucorrhœa. In two-thirds of the patients there was some elevation of temperature, and one-half had lost weight. In very few of the cases was a correct diagnosis made before operation, which was performed in rather more than half the cases. It was found that abdominal fistulæ were much commoner among the cases which were drained. The tubes were involved most frequently of the pelvic organs, and next in order of frequency were the uterus, ovaries, cervix, and vagina. In 99 per cent. both tubes were involved. The operative mortality was 7·6 per cent. and of 90 patients traced 78 were found to be living from two months to 30 years after the operation. Nearly all those alive were in good health.

THE SPUTUM.

By Prof. Dr. HEINRICH VON HOESSLIN. Berlin: Julius Springer. 1921. Pp. 398 + x. M.148.

WE confess to having opened this volume with a certain amount of anxiety. Four hundred pages on the subject of sputum alone seemed to promise redundancy, but the work has afforded us considerable pleasure. It was apparently prepared for publication in the summer of 1914 and was held over by the publishers owing to the outbreak of hostilities. As the author himself points out in his preface, it would be difficult to produce such a work now under the changed conditions of the publishing world.

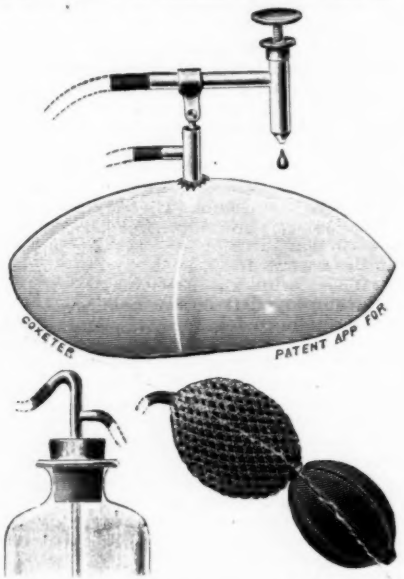
Prof. von Hoesslin has filled a gap in clinical pathology. The consideration of sputum examination is generally relegated to a short chapter, even in works on clinical pathology; but neither pathologist nor clinician can complain here. The book is one to which it is almost impossible to do justice in a review, because it is packed with facts from first to last page, covering the ground from the naked-eye examination of sputum to the bacteriological cultures and differential diagnosis. The cytology, macroscopical and microscopical appearances, the technique of the examination of pigment, the qualities of elastic tissue and crystals, and the chemistry of sputum occupy together rather more than half the book. The second portion deals with the bacteriological aspect of the subject. The accounts given of some of the organisms is not quite as detailed as it might be (e.g., streptococcus, pneumococcus), and the protozoa, notably the spirochætes, do not receive much attention—so hard is it, even in the largest text-book, to be quite comprehensive. The higher bacteria, such as the mucor group, which are liable to give a good deal of worry in the examination of sputum owing to difficulties of classification, culture, and pathogenicity, are not dealt with quite adequately from the point of view of a practical laboratory worker. Perhaps a fuller consideration of non-pathogenic mouth organisms would have cleared up these points.

Diagrams, tables for differential diagnosis, coloured plates—some of them typical, others unconvincing, but practically all well executed—are numerous. It is with relief that we note the omission of the old engravings of Curschmann's spirals which disfigure some text-books, and find instead the inclusion of a series of really beautiful drawings of this somewhat rare appearance in sputum. But perhaps the best indication of the thorough way in which Prof. von Hoesslin has done his work is to be found in the forty closely printed pages of references at the end of the book. We trust that it will not be long before Prof. von Hoesslin has the opportunity of bringing out a second edition of this work in which he will be able to add all the new work of the war years, including the diagnosis by "types" of the pneumococcus and meningococcus, and other recent advances on the bacteriological side. This volume is chiefly valuable as a good reference book on a subject which has hitherto been scattered about the literature of medicine and pathology, and the fuller it can be made the better for the research worker to whom it will largely appeal.

New Inventions.

AN AUTOMATIC ANÆSTHETIC INHALER.

THE inhaler here illustrated consists of a mask to which is attached a small dropper, which can be fixed in any position. The drops are regulated to any speed by rotating the milled head of the valve. The anæsthetic in the bottle is subjected to air pressure by means of rubber bellows, and is forced



through the tube from the bottle to the dropper. When the bellows have been pumped up the liquid continues to flow through the tube at a constant drip for a considerable time without attention, the length of time depending upon the size of the bellows used. The small tube at the side permits oxygen to be given if desired. A rubber band can be used to secure the mask to the patient's face. This mask was designed for use with ethanesal, but can, of course, be utilised for any liquid anæsthetic.

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THE LANCET.

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The Revival of Morbid Anatomy.

NINE years ago the late Sir JAMES GOODHART delivered the Harveian Oration, choosing as his text the Passing of Morbid Anatomy. Whereas, he said, we used to display disease in the gross, the results of disease that is, we are now able to recognise finer changes and more minute evidences of bioplasmic unrest that are behind these results, and they are the goal that we make for now. He had just met the first biochemist. "And pathology still is shifting!" added the orator. That it is possible to question the value of morbid anatomy to medicine might seem absurd to one who had not followed closely the trend of medical thought in the crowded years since GOODHART'S masterly address; but there is no doubt that the pendulum has been swinging somewhat wildly, not only backwards and forwards, but also from side to side, with the result that progress has been erratic. Sir G. SIMS WOODHEAD in our correspondence columns raises points of considerable interest, and particularly worthy of attention is his plea for a more general performance of post-mortem examinations. The last two or three decades have witnessed dramatic discoveries in parasitology, immunity, biochemistry, and physics, and the more humdrum field of morbid anatomy has been to some extent neglected. As is only natural, the recruits have flocked to those branches of medical science which seemed to offer the most brilliant future, for rich harvests are more easily gained from virgin soil than from land which has long been cultivated. But it is becoming clear that even in these fields the obvious discoveries have now been made; future progress can only result from intensive effort, and day by day the boundaries of the expert's knowledge in his own particular science are becoming more and more restricted; the bacteriologist is becoming divorced from the serologist, and in biochemistry a man may lead a full and useful life as a pure devotee of the lipoids. Similarly, on the clinical side, whereas the old-time physician studied all the ills of the body, the modern specialist is often content with a single system as his province, or even a single microbe, for the *Treponema pallidum* and the tubercle bacillus have both their cults, while the activities of a surgeon are frequently limited to districts marked out in the human body by imaginary horizontal lines. This modern system has undoubted advantages, but it suffers from a serious drawback; it is prone to cause atrophy of that most important sense, the sense of proportion. The physician exalts his own particular system above all other organs of the body; the student of vitamins is blind to everything but his mysterious protégés; and the bacteriologist forgets that microbes are, medically speaking, of no importance at all except for the effects they produce on human tissues.

It is necessary, from time to time, for the enthusiast to be brought down to earth that his observations and theories may be compared with cold fact and the test by which he must be judged is morbid anatomy. Physical signs are worthless unless they actually correspond with pathological lesions, and microbes or positive serum reactions must be correlated with definite lesions before they can claim to possess more than an academic interest. This unfortunately necessitates a high degree of coördination between the various workers, a difficult matter, but one which must be faced. The older physicians, such as BRIGHT and ADDISON, needed no pathologist to help them, for they were their own morbid anatomists. They followed their cases to the post-mortem room, and themselves sought there for an explanation of the signs and symptoms they had detected during the patient's life. Liaison officers were unnecessary in those days, but now they are essential. With the progress of morbid histology, pathology has become a vastly wider subject. The detection of gross lesions is no longer sufficient, their elucidation by histological studies is equally necessary, and the physician is therefore compelled to rely upon the expert pathologist. On the other hand, no morbid histologist desires or even claims to be in a position to do his own bacteriology; though, in its early days bacteriology was practised by the general pathologist, the science has now become too unwieldy for this, and demands its own practitioners. But while it is of the utmost importance that all clinical observations, as well as the investigations of the experts in the newer sciences, should be controlled by morbid anatomy, there is another side of the question. Morbid anatomy is a living science, and every day fresh discoveries are being made in the post-mortem room or the histological laboratory. These can only be of value, however, if we understand what they mean, and a proper understanding can only be arrived at by the help of the clinician and the workers in other fields. Just as in the post-mortem room the true meaning of the signs and symptoms recorded in the clinical notes of the case is made clear, so in the records of other workers may the pathologist hope to find the key to his own investigations.

No amount of coördination, however, between himself and his colleague can help the pathologist if there is lacking the coöperation of the lay public. It is true that he may learn much from the study of tissues removed by operation, and it may be pointed out in passing that the so-called science of the pathology of the living comes finally to the study of tissues which have been killed, but the greater part of his work is concerned with the dead. Only in the post-mortem room can he study the late results of disease, and the earlier, even the earliest, manifestations of morbid processes. And here the force of public opinion is directly opposed to his labours. Time after time the work of the clinician is rendered worthless so far as the advancement of knowledge is concerned by the refusal of permission to make a post-mortem examination. And this state of affairs is likely to continue till education and the growth of a more logical mode of thought shall sweep away the prejudice and false sentiment of the layman. If we were asked in what way a thousand persons could best serve the interests of medical research, we would say by leaving orders that post-mortem examinations should be performed on themselves, and by pledging themselves not to refuse permission for similar investigations on their relatives. Such a series of autopsies, if performed by trained observers in the light of such clinical records as Sir SIMS WOODHEAD suggests, might be of incalculable value to medical science and of real benefit to mankind.

Insanity in Law and Medicine.

THE coöperation of medical practitioners and lawyers is necessary whenever questions have to be settled at law relating to insane persons, whether such questions refer to the detention and safe custody of these unfortunate subjects, their civil rights, or their civil or criminal responsibility for their acts. Consequently a paper read recently by Dr. W. G. H. COOK, a barrister and Doctor of Laws, before the Medico-Legal Society, upon the Liability of the Insane in Respect of Civil Wrongs, dealt with a subject very appropriate for such joint consideration. The criminal responsibility of the insane person, and of the person whose defence to a criminal charge is that he was insane when he committed the act, is frequently considered by the courts, and, whether members of the medical profession may approve or not of the test of insanity adopted by the law for such trials, that test is well established and well known. It is not so generally known, and it may have come as a surprise to some of Dr. COOK'S audience, that the degree of liability imposed by the common law upon the mentally deranged person when sued in civil courts differs from that which obtains in criminal trials, and indeed is not defined with any certainty. It has been dealt with to some extent in text-books, and has been the subject of obiter dicta by judges, but no leading case in which the degree of insanity which will excuse a man from the civil consequences of a tortious act appears to have occupied the attention of the Courts of Appeal, so as to supply a precedent of recognised weight.

The general effect produced by Dr. COOK'S survey of the law in the light of such precedents as exist, was that whereas the intention to do wrong is the essential feature of the act which brings punishment upon the wrong-doer, the point of view in a civil action is different. The law is not there enforced by the State in order that crime may be penalised or prevented for the future. It is set in motion by a person who has suffered damage in order that he may obtain compensation for loss or injury inflicted upon him. The consequences of a certain act have to fall upon someone, and the tendency of the law from the earliest times has been to compensate, and to let the insane person bear the burden of his own act, rather than it should be endured by his innocent neighbour. Dr. COOK was of opinion that the general tendency of recent cases bearing on the subject was to excuse the person incapable of an intent to injure, and that this was consistent with the general policy of the law. In opening the interesting discussion which followed, the chairman, Mr. Justice ATKIN, pointed out that the latter contention was open to question. He gave as an example of a tort, in which intent to injure need not be proved even in a sane person, the case of a libel, for the publication of which an action would lie even if the person publishing it was not aware that he was defaming the plaintiff. The speakers who followed, and who included Sir WILLIAM COLLINS and Sir ROBERT ARMSTRONG-JONES, added valuable criticisms, and appeared to be in agreement as to the difficulty of defining insanity with Lord BLACKBURN, who was quoted by Dr. COOK as having said that he had never been satisfied with any definition, and had endeavoured in vain to make one, adding, "I verily believe that it is not in human power to do it." It may be suggested that such definition is for Lord BLACKBURN'S successors on the bench, and not for the medical profession, to consider with a view to the uses to which it is to be put. It will then be for medical men to say how far the individual case comes within that definition or lies outside it. The whole question of the law in relation to insanity is, as has been suggested, eminently one for the Medico-Legal Society to ventilate and discuss.

The Relations of Medicine to Industry.

A MEETING of medical men, working in connexion with industrial establishments, was held on June 2nd at the offices of the Industrial Welfare Society, Westminster, and may mark the beginning of a valuable movement. The meeting was presided over by H.R.H. the DUKE OF YORK, the President of the Society, and was well attended, while our brief report of the two discussions (p. 1257) will show alike the pioneer work which has been done, and the difficulties which stand in the way of quick and smooth progress. It happened that on the same day a series of conferences was commenced at the Guildhall under arrangements made by the Royal Institute of Public Health, when, at one of the Sessions, industrial medicine was the subject of debate. This series of conferences was also opened by the DUKE OF YORK, who in his speech declaring the proceedings open, used the following words: "Industry has too long been carried on without thought of its effect on the worker." The DUKE OF YORK recognised the real reason for holding the meeting.

The conference at Westminster was of a strictly practical nature; it was concerned, firstly, with what could be done to maintain and improve the health of the workers, the second question being what steps ought to be taken to make the resulting advantages of healthy labour quite clear to the minds of the employers. This definite movement on the part of practitioners connected with industrial establishments has been made opportunely. From our report of the comprehensive discussion at the Guildhall it will be seen that each of the medical services of the country still awaits arrangement and coördination, so that at the present moment there is room for new activities to establish themselves and to plan their programmes without interference from old-established customs or interests. The work which has already been done in the factories, for example, in the avoiding of tragedies by timely examination of workmen, and in the prevention of sepsis by prompt attention to injuries, are examples of what may be expected to become commonplace routine; the establishment of dental clinics at many works, the provision of trusses, the shortening of disablement period after accidents by electrotherapy and massage, clinics at the works, the provision of half-time, or light work for convalescents, the removal of men from dangerous work at an age when slight accidents might make them permanent cripples, are examples of care for the individual worker which are already in evidence. But much remains to be done to make unhealthy processes healthy, and to remove the causes of long-standing ills. Industrial phthisis presents huge difficulties. The presence of the doctor in the works, on the Whitley Councils, and on the works committees, will help towards dealing with this difficult situation. But we must go cautiously to begin with. The average medical practitioner has had little opportunity as yet of studying these problems practically or at close quarters with employer and employed, despite the real desire of all to aid and abet sound therapeutics.

Any attempt to upset the management of industrial concerns by ill-considered advice founded on book knowledge would inevitably bring the whole medical movement into discredit. Experience at the works will bring invaluable lessons, but a course of preliminary training would make that experience doubly valuable. There was general agreement at the conference that the general practitioners would have the chief part to play in the improvement of industrial health, perhaps through a rota of works doctors, in which case the works clinic and ambulance room would resemble a "centre" under the Dawson scheme. Whatever the exact method may be that future consideration decides upon, the works doctors must be in close touch with the general practitioner and with the certifying factory surgeons.

We must not make industrial medicine into another "close" specialism, and it is obvious that if the general practitioner is to acquire a preventive outlook, he must have the opportunity of studying the effect on his patient of both home and occupational conditions. We may have concentrated too closely on home conditions. How often have we heard the declaration at health conferences that "consumption is a house disease" by speakers who ignored the well-known effects of certain occupations, and the evidence of the doubled death-rate from tuberculosis of the lungs among males when compared with females. The Industrial Welfare Society (to quote its journal) voices the longing for a revival of practical goodwill between employer and employed. One of the conference speakers said: "This movement must be based on medicine." We feel sure that the medical profession will rise to the occasion and worthily play its part in what the *Daily Telegraph* last Saturday described as "that most promising of modern developments in industry, the prevention of ill-health and the promotion of efficiency in general by medical care in the factory and the workshop." Once inaugurated on safe and sound lines, industrial medicine is likely to go ahead faster than some may think.

FATE OF A BRIGHTON HOSPITAL SCHEME.—A Brighton correspondent writes:—"The only maternity hospital in Sussex is the Brighton and Hove Hospital for Women in West-street, with two small branches—one in Brighton and one in Hove. The institution is in the ninety-first year. Before the war the need of larger premises was so pressing that, an excellent opportunity arising, an old school building was actually secured and would have soon been transformed into a hospital but for the outbreak of hostilities. Within a day or two of the actual taking over by the hospital of their new building the Government commandeered it, and it became the Second Eastern General Hospital, the hospital returning to its old premises. There is no need to enlarge on the changes the war has brought about, but since the return to the new premises negotiations have been going on with the Health Committees of the Brighton and Hove Town Councils and the East Sussex and West Sussex County Councils with the object of coördinating the work of the hospital with the needs of the area it serves, and these have been fatal to the hospital. The final decision was made on May 26th by the Brighton Town Council, which body agreed as follows:—(1) In view of the circular of the Ministry of Health urging that no fresh capital expenditure should be undertaken which can be postponed without material risk to public health; (2) as three of the local authorities concerned have already withdrawn from the scheme; and (3) owing to the high cost involved in the carrying out of the scheme the Town Council cannot proceed further with the scheme. It is a pity such a hospital—dealing with over one thousand maternity cases every year—to say nothing of visits to out-patients—cannot secure the additional accommodation which it so much needs. The raising of a healthy population begins at the cradle."

Annotations.

"Ne quid nimis."

THE BIRTHDAY HONOURS.

THE list of honours issued on the occasion of the official celebration of the King's Birthday contains the names of several medical men who have rendered eminent service both to the profession to which they belong and to the State. Among the new knights are Mr. Arthur Keith, F.R.S., Hunterian Professor and Conservator of the Museum of the Royal College of Surgeons of England; Dr. Thomas Lewis, F.R.S., honorary consulting physician to the Ministry of Pensions; and Dr. Sydney Russell Wells, Vice-Chancellor of the University of London and its Representative on the General Medical Council. In the Irish list is the name of Dr. F. C. Dwyer, ex-President of the Royal College of Surgeons in Ireland, Chairman of the House of Industry Hospitals, and Inspector of Anatomy in Ireland, and in the Colonial Office List Brigadier-General D. J. McGavin, Director-General of Medical Services in New Zealand; both these distinguished medical men have received the honour of Knighthood. In the Order of the Bath Surgeon Rear-Admiral P. W. Bassett-Smith, C.B., is promoted to Knight of the Order, while Colonel C. E. Pollock, D.S.O., Assistant Director of Medical Services, Eastern Command, receives a Companionship of the Military Division. Major-General W. M. Edwards, Director-General, I.M.S., and Colonel W. H. Willcox, late medical adviser to the civil administration in Mesopotamia, receive Knight Commanderships of the Order of the Indian Empire; and Lieut.-Colonel B. H. Deare, I.M.S., Principal of the Medical College, Calcutta, and Dr. Mohendra Nath Banerjee, Principal of the Carmichael Medical College, Belgatchia, Companionships. Major W. D. Neal, Indian Medical Department, becomes a Companion of the Imperial Service Order, and Dr. Ernest Muir, of the School of Tropical Medicine, Calcutta, research worker and missionary, the Kaisar-i-Hind Medal of the First Class. Sir Ernest Hodder-Williams, chairman of Wakley & Son, Ltd., proprietors of THE LANCET, has received the Commandership of the Royal Victorian Order. We congratulate these recipients of well-earned honours.

NEW SOUTH WALES AND INFLUENZA.

THE report for the year 1919 of the Director-General of Public Health for New South Wales is a monument to the thoroughness with which the work of the department is carried out, and in its 273 large pages contains full details of everything connected with public health work, from the usual mortality returns to the value of the 121 pairs of beaverskin trousers made at the State Asylum for Aged and Infirm Men, Parramatta. Section five, which runs to 100 pages or more, consists of the report on the influenza epidemic of 1919 and is an admirable account of that invasion, considered under the following headings: Epidemiology, Administrative measures, Mortality statistics, and lastly the Pathological, bacteriological and ætiological investigations into the epidemic in Sydney, contributed by Dr. J. B. Cleland, principal microbiologist to the department. It is interesting to read that the quarantine cordon was successful in preventing the arrival of the second and virulent wave until January, 1919, whereas infected ships reached the ports in October, 1918. The actual case-mortality was not so high as it was in England. Careful investigations have shown that in the metropolitan area 290,000 persons, or 36·6 per cent. of the whole population, were attacked with a mortality of 3902, or 1·3 per cent. Among pregnant women not previously inoculated the mortality-rate was found to be 30·6 per cent.,

while in those who had been inoculated previously it was found to be 9·5 per cent. Both figures confirm the very grave risk the disease brings to expectant mothers.

The prophylactic measures taken were remarkable and complete. Proclamations were issued closing all libraries, schools, churches, theatres, picture-palaces, and all other places of indoor entertainment. The wearing of masks in trains, trams, public places, and shops was made compulsory. Public meetings for any purpose either indoor or in the open air were prohibited, racecourses were closed, and church services, at first prohibited, were only permitted in the open air under certain restrictions and regulations for the quarantining of influenza contacts. As regards protective inoculation, Australia had an unique opportunity to exploit the value of this measure. The time which elapsed between the arrival of the first influenza infected ships in October, 1918, and the invasion of New South Wales in January, 1919, was utilised by the department to manufacture large quantities of mixed vaccine having the following composition:—

Pneumococcus	1000 millions.
Influenza bacillus	100 ,,
Streptococcus	100 ,,
Staphylococcus aureus	250 ,,
M. catarrhalis group	250 ,,

A conservative estimate of the total number of inoculations performed in New South Wales was 819,683, which brings the number of people so treated to 404,803. In Sydney between 35 and 40 per cent. of the whole population were inoculated. Among the inoculated the mortality was 10·7 per cent.; among those not inoculated it was 16·5 per cent. Further, it is shown that the mortality fell regularly according to the number of inoculations. Among those inoculated once it was 11·1 per cent., among those twice inoculated 10·1 per cent., and it was 8·2 per cent. among those inoculated three times. The effect of inoculation in preventing an attack is known to be slight, if any, but figures are here produced which show that it has no tendency to increase the susceptibility of the person inoculated, or in other words, the question of the negative phase may be disregarded.

Dr. Cleland summarises his personal deductions from the immense amount of information he had at his disposal and amongst his conclusions from the pneumonic cases he states that:—

1. The primary æti ological agent of influenza is unknown but is probably a virus of the filter-passing group.
2. The primary lung lesions are probably directly due to this virus.
3. Both lungs are usually more or less involved, the upper lobes in most cases, the lower lobes less often.
5. In fatal pulmonary cases a bacterial growth is usually obtained comprising one, two, three, or more groups of bacteria, of which pneumococcal organisms are the most prevalent, while the influenza bacillus, streptococci, and *Staphylococcus aureus* occur in about one-third of the cases.
6. These bacteria are believed to be secondary invaders flourishing in the exudate and hæmorrhagic areas resulting from the primary virus.
8. Vaccines seem to have led to a quite distinct though not very great diminution in the mortality.
9. Inoculations of animals with infective material have proved of no value except to show that the rhesus monkey is almost completely refractive to the disease.

The macroscopic features presented by the diseased lungs were protean in character, so much so that it is difficult to describe in general terms the appearances that may be expected in any one case. A series of very beautiful coloured plates illustrates the various lesions found in the lungs, and the coloration produced by them; the appearances in the Australian epidemic being precisely similar to those recorded in England, France, America, and other parts of the world during this widespread epidemic. When discussing the use of vaccines Dr. Cleland mentions the remarkable feature which has been observed in this country also, not only in connexion with influenza vaccine, but after the use of T.A.B. vaccines in the army during the days of the war—namely, that many persons suffering from forms of chronic rheumatism or other complaints of a similar nature derived unmistakable benefit from the injections. It was found that a number of persons made a practice of attending the inoculation depôts weekly in order to maintain the benefit they derived for these chronic affections. Dr. Cleland concurs with the views of observers over here, that the beneficial substances are the foreign proteids introduced into the systemic circulation. Emphasis is laid on the value of masking both as a means of preventing the exit of the virus from those infected and of preserving the non-infected from inhaling infection.

The report forms a very complete record of an epidemic which it was possible to observe from before its commencement to its, fortunately, not long-delayed termination. As an account of the measures both preventive and curative which can and should be taken by an intelligent administration it is of the highest value and the work should be retained for reference in all medical libraries.

SELF-DISINFECTION: THE GOVERNMENT'S ATTITUDE.

THE Ministry of Health has sent a circular dealing with the prevention and treatment of venereal diseases to the authorities of counties and county boroughs in England and Wales. We give the substance of this circular on p.1256. After careful consideration of the evidence the Government, it is stated, find that there is general agreement that the best way to avoid risk of venereal disease is to abstain from promiscuous sexual intercourse, disinfection applied immediately after exposure to risk of infection being effective only to the extent to which it can be thoroughly applied in the particular case. They find that medical opinion is divided as to the practicability and likelihood of the success of self-disinfection by the civil population, whereas on the moral and social side weighty objections have been advanced against it. In the circumstances the Government have decided that, whatever the individual or groups of individuals may practise or recommend, they cannot make a system of self-disinfection for the civil community part of their official policy. It is hoped that this clear statement on behalf of the Government may form a useful basis for united coöperation of persons and societies concerned in the campaign against venereal diseases.

EXHIBITION OF X RAY PHOTOGRAPHS.

INTERESTING X ray photographs are being shown at the house of the Royal Photographic Society, 35, Russell-square, London, W.C. The exhibition is under the auspices of the Rontgen Society, and contains more than 250 prints, some of which arrived by special aeroplane from Paris too late to be included in the official catalogue, though short descriptive notes are attached where available. Specimens of the work of the late Dr. C. Infroit, of the Hospice de la Salpêtrière, Paris, are on view. Drs. Vignal, Haret, and Contremontez have sent remarkable examples of their radiographic work, and specimens of metal radiography have been contributed by the firm of Giaffe-Gallot and Pilon. Among the notable work contributed by radiographers in this country is a fine series of prints illustrating various abnormalities of the vermiform appendix, by Dr. C. Thurstan Holland. The Cancer Hospital is represented by some good prints recording the progress of opaque meals. Prints of paintings are shown by Dr. A. Chèron and the Sunic Research Laboratory, and illustrate the application of radiography in the detection of fraud. Some photographs taken by Mr. A. Campbell Swinton in 1896 are of historic interest. Dr. R. W. A. Salmond shows some good work, and the comparative results obtained

with the new Impex plates and the ordinary X-ray plates, by Dr. G. H. Rodman, the president of the Royal Photographic Society, are of special interest. A series of plates taken with a portable apparatus in France, by Miss Phyllis Berry and Miss Collum, late of the Scottish Women's Hospital, illustrates some of the war-time applications of the X ray. The exhibition generally marks a distinct advance, and the opportunity of direct comparison of the work of radiographers in this country with that of workers abroad is of considerable value in demonstrating different methods of procedure. The series of sets of four prints produced by lay workers employed either in the radiographic departments of hospitals or acting as assistants to qualified radiographers, are specially helpful in this respect, entries for prizes offered by Dr. R. Knox are of a high standard. The first prize has been awarded to Mr. Suggars, of the London Hospital, and the second to Mr. A. O. Forder, of King's College Hospital. The exhibition will remain open daily throughout June (Sundays excepted) from 11 A.M. to 5 P.M., and admission is free.

EXCESSIVE PROTEIN IN DIETS.

WE drew attention in THE LANCET of April 16th to the important observations of T. B. Osborne and L. B. Mendel, of Yale University, on growth with diets poor in true fats, and growth without preformed carbohydrate in the diet. The same observers [1] discuss the question of growth with diets containing more than 90 per cent. of protein. Although it has been demonstrated that a carnivorous animal can be kept alive and maintained in activity for considerable periods on an exclusive diet of meat, it is not known whether growth as well as maintenance can proceed on a regimen entirely free from both fats and carbohydrates. Hammarsten has stated that omnivora and herbivora cannot survive on such a ration. The authors' successful experiments in growing rats on food extremely poor in fats and in carbohydrates respectively encouraged them to test diets containing only minimal quantities of *both*. The mixtures included protein 95 per cent., inorganic salts 5 per cent., with a supply of vitamins A and B in the form of tablets of alfalfa (0·4 g.), and dried brewery yeast (0·2 g.) daily. On such diets, when casein furnished the protein, animals have already grown to three times their weight at the beginning of the trial. The vitamin-bearing substances were the only noteworthy sources of either fat or carbohydrate, and supplied 4–8 per cent. of the food eaten. If future experiments prove as successful as those described by these authors, then various problems of nutrition and physiological function can be approached from new experimental standpoints. The earlier experiments by Hammarsten, few in number in relation to this problem, were conducted on a less satisfactory plan, the food mixtures being inadequate in respect to one or more essential factors. It is to be noted that in Osborne and Mendel's experiments the growth of the rats was observed only until their weight was trebled. It has still to be determined whether rats will attain adult size and normal functions on diets furnishing proteins as the almost exclusive source of energy and tissue substance. The communication in our present issue from Miss G. A. Hartwell would seem in the first place to indicate that there may be exaggeration even in the diet of a lactating mother. We know little of the metabolism of even a single protein in any single animal, and practically nothing of the transformations of proteins in a suckling mother and of the metabolites that may be discharged in the milk under abnormal or even normal conditions of nutrition. It would be interesting to have an analysis of the milk in other animals giving suck while consuming excess of proteins. Experiments have been made which show that the metabolic machinery of adult rats works in a different way from that of young rats. Grown rats fed on one protein, gliadin, with the other essentials of a diet, remain active and healthy and capable of reproduction. The offspring appear normal and grow actively as long as they are suckled by the mother, but if after weaning they are fed on the same diet as the mother, growth ceases at once. The young animal would seem to be unable to manufacture something which is present in the maternal pabulum, and which is not present in the constitution of the directly-fed gliadin. Once the growth stage is over, some new machinery must arise capable of transforming the gliadin.

[1] Proc. Soc. Exp. Biol., 1921, xviii., 167.

FIBROMA OF THE OVARY.

ACCORDING to Dr. Edmund D. Clark and Dr William E. Gabe[1] of Indianopolis, who record a personal case in a single woman aged 46, fibroma of the ovary is a sufficiently rare condition to warrant the publication of all carefully studied cases. They quote statistics derived from various sources showing the surprisingly small number of true ovarian fibromata encountered in large clinics or by men with an extensive experience of pelvic surgery. Only three examples were found by Sir Spencer Wells among 1200 ovariotomies. Kelly, in 1200 laparotomies, found only four cases, and Hellman reported only six instances among 4500 pathological specimens at the Woman's Clinic at the Berlin Charité in the course of ten years. Hellman and Reel estimate that fibromata constitute approximately 2 per cent. of all ovarian tumours. They occur from the time of puberty up to an advanced age, the youngest case on record being in a girl aged 17 and the oldest in a woman of 73. The majority occur in single women and about the menopause. Their size and weight vary extremely, the smallest ones being enclosed in ovarian tissue, while the larger ones weigh as much as 56 pounds. Their consistency is also very variable, some being composed of a loosely woven network of connective tissue, while others are so dense that a bone saw is needed for their section. They are liable to various changes, such as œdema, necrosis, hyaline formation, and fatty degeneration. The diagnosis is dependent solely on microscopical examination, which in typical cases shows a certain regularity of the individual fibres or muscular cells and strands, despite varying quantities of cells, fibres, vessels and degenerative changes. The principal feature in the symptomatology of ovarian fibroma is the presence of a hard, unilateral movable tumour, accompanied by ascites. Pain is of varying degree and is often absent altogether. Other symptoms, such as frequent micturition, constipation, &c., are due to mechanical factors. Owing to its absence in other tumours of the ovary and its rarity in fibromata elsewhere, especially in the uterus, the occurrence of ascites is of considerable diagnostic value. The prognosis of ovarian fibroma is invariably good. Treatment is exclusively operative.

[1] Amer. Jour. of Obstetrics and Gynecology, March, 1921.

POST-GRADUATE MEDICAL STUDY.

A RECENT newspaper announcement has reached this country of a scheme of medical amalgamation, rendered possible in New York by private munificence, whereby the medical faculty of Columbia University has been able to amalgamate with the Presbyterian Hospital, which is one of the largest hospitals in the city. Those who are familiar with the medical institutions of New York will be able to appreciate the comprehensiveness of the scheme, for which the claim has been made that, in point of size and equipment at least, a medical centre has been created which will be "the greatest in the world." The organisation thus brought into being has been endowed to the extent of £3,000,000—

a sum provided, in several instances anonymously, by a few wealthy families of the United States; the donation of one contributor amounted to £1,000,000; a site, anonymously presented, was valued at a quarter of a million. The bestowal of sums of this magnitude marks a high order of philanthropy, for it brings no material gain to the donor, whilst enormously benefiting the community. In this country a minimum sum of £30,000 is needed in order to place the Fellowship of Medicine Post-Graduate Medical Association upon a firm financial and imperial basis, and we trust it will not be long before some public-spirited benefactor comes forward to render possible a medical enterprise of vital importance. In most instances of generosity similar to those we have mentioned, it may be assumed that the undertaking in question has been ventilated, and its value emphasised, before the evocation of so admirable a response; in other words, the needs of the Post-Graduate Medical Association of the Fellowship of Medicine must be clearly and repeatedly stated, both by the spoken and the written word. Individual effort must be brought to bear; with such a meritorious end in view an extended appeal can hardly fail of its effect. The novel form of requirement may cause some possible donors to hesitate, but it is just as likely to attract others by its novelty. In this connexion it is gratifying to note the increasing number of post-graduates joining the Association, particularly as the later summer, most usual and favourable time of year for post-graduate courses, has not yet come. The augury is for a successful session. It may, perhaps, be repeated that the sum of £30,000 for which the Fellowship of Medicine appeals is the minimum amount required to set the Post-Graduate Medical Association in a position worthy of the country which will reap the benefit of its activities.

ARSENOBENZOL IN SYPHILIS.

Dr. Joseph Nicolas, of the Lyon School of Medicine, gives an excellent summary of the treatment of syphilis in the *Journal de Médecine de Lyon* for April 20th. He prefaces his article with the following dicta: 1. That the arsenobenzol compounds afford the best treatment of syphilitic lesions not only from the point of view of cure but also from that of prevention. These may be supplemented by mercury in cases of intolerance, of resistance to arsenical treatment, or where such treatment is not available. 2. That when the lesions have disappeared under the influence of these injections it is necessary to submit the patient to a treatment which is methodical, regular, and of long duration, such treatment being intense during the first years and moderate during the later years, but in all cases being carried out over a considerable period—four to five years or even longer. 3. That the Wassermann reaction is a sign without any absolute value, which taken alone affords no guide to treatment. To await the return of a positive reaction before continuing treatment is to indulge in an absolutely unjustifiable opportunism.

After discussing the advantages and disadvantages of various arsenobenzol compounds and the different methods of administration of mercury, the author gives a standard table of treatment extending over a period of five years. Following this is a summary of treatment suitable for special cases. Cases of albuminuria are to be carefully investigated from the point of view of renal function before undergoing treatment. In cases of severe renal disease treatment with arsenobenzol compounds must be absolutely proscribed, the author quoting a case as an example in which uræmic coma was precipitated as the result of a single injection of 0·15 g. of novarsenobenzol in a patient suffering from renal tuberculosis. He considers that arsenical compounds are in any case less irritating to the kidneys than mercury, and on this account afford the treatment of choice in syphilitic albuminuria. Lesions of liver are of still greater importance from the point of view of treatment. As a general rule it may be said that no arsenobenzol compounds should be given when the liver is diseased. Reliance in such cases should be placed on mercurial treatment. Arsenobenzol injections must be immediately abandoned on the appearance of jaundice. If, however, jaundice has existed before commencing treatment, or after the first injection (possible Herxheimer reaction), the prohibition of novarsenobenzol need not be absolute, but only very small injections should be given, and a careful look-out kept on the patient. Laryngeal symptoms also necessitate special precautions, especially when there are indications of œdema and stenosis. In such cases a preliminary course of mercury must be administered, preferably intramuscular injections of biniodide or intravenous injections of cyanide. When some improvement in the condition of the larynx has been obtained arsenical treatment may be instituted.

Discussing the treatment of ocular syphilis the author remarks on the innocuousness of the arsenobenzol compounds compared with atoxyl from the point of view of bulbar neuritis. After having given 120,000 injections of arsenobenzol he has only come across one case of optic neuritis, and there was nothing to prove that this was due to novarsenobenzol. In the treatment of neuro-syphilis the author prefers intravenous injections of novarsenobenzol. Small doses should be given, and on no account must the slightest reaction be provoked; deplorable results follow the employment of doses producing a reaction. General paralysis is not affected at all by treatment. In the treatment of pregnant women he again uses small doses of 0·15 to 0·3 g. of novarsenobenzol, and in cases of intolerance intravenous injections of cyanide of mercury. As a routine treatment for syphilitic babies he prefers mercurial inunctions. When a rapid action is necessary he recommends intravenous injections of novarsenobenzol, 0·01–0·025 g. per kilo of weight. However, he considers arsenical treatment in infants not without danger and regards it as expensive. When an apparently healthy child is born of parents known to be syphilitic, the author pays special attention to the appearance of the placenta; if this is voluminous or shows signs of disease he institutes treatment of the child even in the absence of any signs of congenital disease.

Dr. Nicolas's summary of treatment emphasises two points: first, that novarsenobenzol compounds are the medicaments of choice in antisyphilitic treatment; and second, that such treatment must be continued over a much longer period than is generally recognised in France.

THE FRESH AIR CULT.

THERE are probably few medical men to-day who are not convinced of the value of an open-air life, in so far as this is practicable, in building up the individual resistance to infection, more especially in the case of children and of young adults. At the Congrès d'Hygiène Scolaire de Langue Française, which took place in Paris early in April, one of the subjects discussed was that of open-air schools, mainly for pre-tuberculous subjects and for children suffering from tuberculous adenitis and from latent tuberculosis. Various aspects of these schools were emphasised by the different delegates, one speaker, for example, pointing out that much more use could be made for this purpose of the open spaces in large towns. Another dwelt on the importance of a carefully graduated course of heliotherapy in each individual case, the duration of exposure being increased till the child can be left in the sun for many hours in the day; he had seen astonishing results on the physical condition, the powers of resistance, and even on the character. Yet another delegate recalled how a year previously the speakers at a meeting of the Society of Public

Health expressed a dread lest a catastrophe, such as the occurrence of a fatal case of broncho-pneumonia should kill the new venture of open-air schools, whereas as a matter of fact the pupils at these particular institutions had shown an extraordinary resistance to catarrh and infection of all kinds. The effect of an open-air life in increasing the weight is shown by Dr. Mestrezat in the March issue of the *Revue d'Hygiène*. The particular case described at some length is that of a healthy medical man of 32, whose average weight in Paris in 1914 was kg. 54·5, rising in 1915, when he was living an open-air life and taking daily exercise, to 58·1; falling again gradually to 56·1 in 1915–16 when living in a country town with three hours exercise daily; and falling again steadily to 54·6 in 1921 on resumption of life in Paris. Other instructive tables given by the same writer deal with the rapid and progressive gain in weight of soldiers convalescent from chicken-pox and mumps under the open-air treatment, the diet being the ordinary army rations in no way modified. After all this it is something of a shock to find in the March number of the *Archives de Médecine des Enfants* an article dealing with the treatment of the pre-tuberculous state in children, in which the writer deprecates open windows at night for such cases, quoting and endorsing the opinion of another medical authority as to the disadvantages in the shape of coryza, bronchitis, diarrhœa, and conjunctivitis which more than counterbalance any possible advantages to be derived from the practice. After hinting that most of the doctors who prescribe the treatment do not practise it themselves, he adds that in summer, during the hottest months, the windows may be partly open during sleep provided that there are curtains or blinds that can be drawn, but the warning is added "Il faut veiller surtout ce que l'air n'arrive pas directement sur le lit de l'enfant." This echo of past teaching contrasts strangely with the almost unanimous opinion in the medical world of to-day as to the value of fresh air in health and in sickness. "There's night and day, brother, both sweet things"; and it is surely time that the phantom-bogy of the danger of night-air should be laid once and for all.

DILATATION OF THE ŒSOPHAGUS WITHOUT STENOSIS.

DILATATION of the œsophagus in the absence of any anatomical stenosis has aroused considerable attention during the last few years, especially since skiagraphy and the use of the œsophagoscope has rendered its diagnosis a matter of comparative ease and certainty. Enormous dilatation may take place with almost total inability to swallow, producing complete failure of health and even death, and yet there is no obstruction whatever. A full-dress debate was held on the subject a couple of years ago at the Laryngological Section of the Royal Society of Medicine,[1] accompanied by an excellent series of pathological specimens, but it cannot be said that the ætiology has been finally explained. Certain points are established—namely, that food is arrested at the level of the diaphragm and not at the cardiac orifice, that there is no hypertrophy of the cardiac sphincter, and that the muscular wall of the gullet is not atrophied but rather hypertrophied. All records of cases of this affection are therefore of interest, though one of the most recent contributions, a paper by Dr. R. Bensaude and Dr. G. Guénaux, of the Hôpital Saint-Antoine in Paris,[2] also fails to clear up the doubtful points in its causation. Referring to the ease of diagnosis due to modern methods, the authors state that one of them, who had only seen one case in 15 years, has now diagnosed 17 cases in 18 months. Of these 17 cases 12 were females, and the neurotic element was an evident factor, the influence of the emotions during the war being very manifest. The age-incidence was very variable, two cases beginning in childhood, one o. them at the age of 6, but the majority occurring between the ages of 33 and 55. The symptoms are fairly constant, with a slow insidious onset, a sensation of arrest of food at the lower part of the gullet, eructations, rumination, inability to take certain foods, regurgitation, vomiting, cough, dyspnœa, and periods of complete occlusion. The vomiting is without nausea or effort, and suggestive of the overflow of an over-full vessel. On X ray examination the opaque substance is arrested above the diaphragm, and gives a very characteristic cylindrical shadow ending in a regular finely-pointed extremity. On œsophagoscopy the dilatation is evident, and the entire wall, from top to bottom, is arranged in transverse folds; the aspect of the cardia is variable; the genu-pectoral position is recommended for this examination. Unfortunately none of the seven cases described are uncomplicated cases of idiopathic dilatation.

[1] Proceedings of the Royal Society of Medicine, Section of Laryngology, vol. xii., No. 5, March, 1919.

[2] Contribution à l'Etude de la Dilatation Diffuse et Généralisée (dite idiopathique) de l'Œsophage, Revue de Médecine, 1921, No. 2, p. 3.

RADIOGRAPHY IN OBSTETRICS.

A SERIES of remarkable radiograms, published by Prof. Sebastián Recasens in the February number of *La Clinica Castellana*, brings forcibly to the attention the many possibilities of radiography in the field of obstetrics. There is, for example, the problem of the twin pregnancy, up till the present rarely diagnosed with certainty except by the detection of two sets of fœtal heart sounds beating in distinct rhythms. Not only does X ray assistance settle this problem, but it goes further and displays the relation of the twins to each other and to the maternal pelvis. There are numerous ante-partum conditions which may be revealed with certainty by this method to the great assistance of the obstetrician; among such may be mentioned fœtal deformities, hydrocephalus, and the various degrees of extrusion of the fœtal head. Prof. Recasens challenges the accepted view, expressed in all text-books (and copied, so he says, from one to another) that the fœtal limbs in utero are normally completely flexed. The published radiograms seem to bear out his contention.

SIR FREDERICK BANBURY'S REASONING.

IN moving the second reading of the Dogs Protection Bill Sir Frederick Banbury extracted from a series of editorial articles which appeared in THE LANCET some two years ago one line, which means nothing without the context, but on the strength of which he seems to have claimed our support for his contentions. For future quotation in any reasoned speech he may make on the subject we bring to his notice our considered opinion on the Bill, as expressed in the closing sentence of one of the articles which he may be supposed to have consulted already. "The limitations which are intended to be put upon medical research may bear sad fruit when this readiness to put sentiment and sensibility ahead of sense and truth will not appear such a humane proceeding as many now consider it to be."

WE regret to announce the death on June 2nd of Dr. John Matthew Fortescue-Brickdale, physician to Clifton College and the Bristol Royal Infirmary, and an authority on pharmacology.

Dr. E. G. Graham Little has been elected by the graduates of medicine and surgery of the University of London to serve a fifth term of office as representative on the Senate.

CONTROL OF VENEREAL DISEASE.

COUNTY COUNCILS AND VENEREAL DISEASE: AN OFFICIAL CIRCULAR.

THE Government, as is well known, have had under consideration the policy hitherto adopted in this country for dealing with venereal diseases, and the question whether any modification of that policy is required at the present time. The outcome of this consideration is the issue by the Ministry of Health of a circular (No. 202), dated May 31st, 1921, dealing as follows with the present position of the prevention and treatment of venereal diseases.

Basis of the National Scheme.

As the Council are aware, the national scheme for the prevention and treatment of these diseases is based upon the recommendations contained in the Final Report of the Royal Commission on Venereal Diseases. The main recommendations of the Commission were: 1. That gratuitous treatment for persons suffering from these diseases should be provided at hospitals and other institutions in all parts of the country. 2. That a widespread campaign of publicity and education as to the dangers and effects of these diseases, and as to the necessity for early and skilled treatment, should be undertaken. These recommendations have been and are being carried out under schemes formulated by the Councils and approved by the Minister of Health or his predecessors, while the propaganda campaign, in accordance with the recommendation of the Royal Commission, has been directed, centrally by the National Council for Combating Venereal Diseases, under the supervision of this Department, and locally by the County and County Borough Councils, a large number of which have coöperated with the local branches of the National Council in carrying out measures of publicity and education. In a few areas, also, Ablution or Disinfecting Centres have recently been instituted as an experimental measure in order that facilities may be provided for the disinfection, by skilled attendants acting under medical supervision, of persons who have exposed themselves to the risk of infection with these diseases.

War-time Experience.

The experience gained during the war by different armies in attempting to prevent the spread of venereal diseases has given rise to question whether, in the case of the civilian community, some further measures should not be adopted with a view to diminishing the incidence of these diseases, and after the conclusion of hostilities this question was considered by an Interdepartmental Committee appointed by the Minister of Health. This committee came to the general conclusion that although certain drugs, if properly and skilfully applied, are efficacious in preventing venereal diseases, the most carefully organised system for the supply of these drugs in "packets" and the instruction of men as to their use, did not produce such a general reduction in the incidence of these diseases as to warrant its recommendation by the Government. It was, however, found that where preventive treatment was provided, after exposure to the risk of infection, by a skilled attendant, the results were better than when the same measures were taken by the individual affected, even after the most careful instruction. Unofficially also this question has recently been under consideration by a special committee of the National Birth-rate Commission, and the conclusions of that committee are contained in a report which has now been published.

The Question of Self-disinfection.

The Government have given careful consideration to the question on which the views of these two committees, official and unofficial, are not completely in accord—namely, the question of self-disinfection—but they find that there is general agreement on the following conclusions: 1. That the best way to avoid risk of venereal disease is to abstain from promiscuous sexual intercourse, and that a steady and continuous policy of public enlightenment on this point, and as to the risks of venereal disease and its resulting consequences on the general health of the community, is essential. 2. That disinfection immediately after exposure to risk of infection is effective only to the extent to which it can be thoroughly and intelligently applied in the particular case. They also find that medical opinion is divided on the question of the efficacy of self-disinfection for the civilian population, and in particular on such questions as (1) whether it is practicable to give such instruction to the population generally as will ensure that the disinfectants are thoroughly and skilfully applied; (2) whether the spreading of knowledge as to the efficacy of disinfectants would not lead to persons running the risk of infection who would otherwise avoid that risk, and thus increase the spread of disease; and (3) whether the disinfectants will not be used in some cases for the treatment of developed disease with the result that proper treatment will be delayed and the cure of the disease rendered more difficult and uncertain.

The actual situation which confronts the Government is that there is not unanimity of opinion on the medical side as to the practicability and likelihood of success of self-disinfection for the civil population, whereas on the moral and social side most weighty objections are advanced against it. It is clear that this question is one which cannot be decided solely by reference to medical opinion—moral and social considerations of very great importance are involved in it. In the circumstances the Government have decided that they cannot give official support to self-disinfection as a policy.

Public Instruction.

The decision of the Government emphasises the importance in the interests not only of the individuals concerned, but also in those of the community in general, of continuing and extending public instruction and enlightenment as to the dangers arising from promiscuous sexual intercourse, and the disastrous consequences on the general health of the community which result from the spread of venereal diseases. The Minister is aware that in most parts of the country a wisely directed campaign has been, and is being, carried on in this direction, and he is advised that it is essential that no opportunity should be lost of educating public opinion on this matter. It is important that the Council should call to their aid every available agency in their area which exists for the purpose of the moral and social betterment of the people, and the assistance of voluntary organisations of this kind should be most valuable in advising as to the lines on which a campaign of publicity and education can best be directed and as to the contents of such leaflets, posters, &c., as the Council may issue. It is essential that due economy should be exercised in this matter as in all other public services at the present time, but the Minister trusts that the Council will not curtail their expenditure during the current financial year on educational and propaganda work in connexion with these diseases, and he is prepared, as indicated in paragraph (6) of Circular 192, to consider applications for his approval of limited expenditure for this purpose in excess of that incurred by the Council during the past financial year. This is a matter also in which the Council would be justified in looking to voluntary bodies for some financial assistance.

Issue of Warning Leaflets.

The question of the contents of any publications which may be issued by the Council on this subject is one for the decision, in the first instance, of the Council, but the Minister desires to suggest the advisability of the widespread issue of leaflets, &c., warning the public of the dangers of venereal diseases and containing advice on the following lines:—1. The prevalence of venereal diseases is a grave source of danger and ill-health to the public. 2. These diseases are usually contracted through promiscuous sexual intercourse, and the best way to avoid risk is to avoid such intercourse. It is the duty of all individuals who have incurred, or think they have incurred, the risk of contracting disease, to cleanse themselves thoroughly and immediately, and thereby diminish the risk. 3. If any signs or symptoms of disease, however slight, are experienced the individual should promptly seek medical advice or attend a venereal diseases clinic. 4. Any attempt at self-treatment of these diseases is likely to be disastrous.

Ablution Centres.

The Minister is of opinion that the arguments which have influenced H.M. Government in deciding against any official advocacy of self-disinfection do not apply to the provision of ablution centres where facilities are provided, with proper safeguards, for disinfection by skilled attendants acting under medical supervision. The experience so far obtained is not sufficient to enable any final conclusions to be drawn as to whether such ablution centres should be established permanently in large towns; but the evidence available as to the results obtained in different armies from the provision of these centres justifies further experiments of the same kind for the civilian population, and the Minister is accordingly prepared to consider applications for his approval of the experimental provision of further ablution centres.

Legal Position of Chemists Selling Disinfectants.

It is understood that questions have arisen as to the precise effect of section 2 (2) of the Venereal Disease Act, 1917, and the Minister considers it desirable to state that, although he is not empowered to give an authoritative

interpretation of the provisions of any Act of Parliament, he is advised that a chemist does not commit an offence by selling any substances for which he is asked, merely because those substances are capable of being used as disinfectants against venereal diseases, so long as the substances are not sold accompanied by any written or printed recommendations or instructions as to use. It should be carefully borne in mind that by sections 1 and 2 (1) of the same Act, an offence is committed by any person (other than a duly qualified medical practitioner) who for reward direct or indirect, treats, prescribes for, or offers advice in connexion with the treatment of venereal disease, and by any person who does any of these things or even offers to do them, by advertisement, public notice, or announcement.

It will be seen that the official circular has the merits and the limitations which could have been foreseen from the announcement in the House of Commons made by the Minister of Health on the vote to meet the expenses of the department.[1]

INTERNATIONAL LABOUR COÖPERATION.

At the recent International Congress of Transport Workers, held in Geneva, a discussion arose on the treatment of venereal disease amongst seafarers, and a resolution was passed calling upon the executive to initiate a movement in favour of international legislative measures, and to enter into negotiations with the International Organisation of Shipowners with the object of giving effect thereto. On the suggestion of Mr. Walter Clarke, chief of the Division for Combating Venereal Diseases of the League of Red Cross Societies, this resolution was transmitted to the Office International d'Hygiène Publique for its information. In forwarding it, Lieut.-Colonel T. F. Ritchie, assistant chief of the same Division, writes:—

"I think it is very encouraging to see that the transport workers themselves realise the importance of providing treatment for seafarers, and that they wish to initiate international legislative measures in regard to venereal diseases."

We hope that the example set by the Transport Workers' Federation will encourage other industrial bodies to take similar action within their own borders. More good will come of it than from any external attempt to impress such suggestions upon their members. The holding without delay of an international anti-venereal congress would afford the required opportunity for the other industrial federations to be represented and to take appropriate action.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

The second annual meeting of this Society was held on June 6th at the house of the Royal Society of Medicine, Lord Willoughby de Broke, the President, in the chair. The President said that venereal disease was still proceeding at such an alarming rate as to be a great public danger. The official policy of exhorting the public to be chaste and advising them to consult a doctor when infected had not succeeded in preventing its spread. The circular recently issued by the Ministry of Health stated that it was the duty of all individuals who had incurred the risk of infection to cleanse themselves thoroughly and immediately in order to diminish the risk. The President urged that this statement affirmed the Society's policy of self-disinfection, though the Government would not take responsibility for the official issue of disinfectants accompanied by instructions. He moved a resolution recommending formal application by the Society to the Ministry of Health for sanction for the preparation and sale, under the supervision and control of the Society, of materials for immediate self-disinfection. This resolution was seconded by Lady Askwith and was carried. The hon. secretary, Mr. Wansey Bayley, in submitting the annual report, said that the number of county and borough councils which had adopted the Society's policy had increased from 12 to 20.

[1] THE LANCET, May 21st, p. 1088.

ROYAL INSTITUTE OF PUBLIC HEALTH:

CONFERENCES ON PUBLIC HEALTH PROBLEMS.

ON June 2nd, at the Guildhall, a series of Conferences on various questions concerning the health of the nation was opened by H.R.H. the DUKE OF YORK. In welcoming the delegates His Royal Highness said that the work of the Conferences was of national and international importance, and that the immense significance to the nation of such questions as the support of voluntary hospitals and the improvement of housing conditions could not be too much emphasised. Other matters of vital importance to the community were venereal disease and tuberculosis. As President of the Industrial Welfare Society he took great interest in the subject of the Session dealing with the necessity for greater attention to the maintenance of efficiency and the prevention of ill-health in industry. Industry had too long been carried on without thought of its effect on the worker, and it is good, he said, that the questions of industrial physiology and psychology and vocational aptitude should be seriously discussed. The future prosperity of the country was bound up with the establishment of a healthy, happy, and contented industrial army.

The LORD MAYOR on behalf of the City of London, having welcomed the delegates,

Sir ALFRED MOND, the Minister of Health, moved a vote of thanks to the Duke of York, who, he said, was following the great traditions of his House by taking the keenest interest in the public health of the country.

Lord LEVERHULME seconded, and the Duke of York in his reply expressed his appreciation of the honour which had been conferred upon him in being made an Honorary Fellow of the Royal Institute of Public Health.

MUNICIPAL HYGIENE AND VOLUNTARY HOSPITALS.

Lord BURNHAM, who presided over the session on Municipal Hygiene, said that the Conference was not only opportune but necessary in connexion with the administration of the Poor-law and the future of voluntary hospitals. The whole system of local administration had to be considered, for there were no longer any scientific frontiers of local government; they had disappeared in the cataclysm of the great war, while the welfare of the community depended upon the health of its individual members. Some people believed that the transformation of the Local Government Board into the Department of Public Health meant only a change in name, but that there had really been a change in Parliamentary attitude and consideration was shown in the fact that the Minister of Health was on the platform that morning. The real problem of public health was how to link up the various health services and health institutions with the system of national insurance. The great defect of the National Insurance Act was that it ignored the existing services and institutions from the financial and administrative points of view. The voluntary hospitals were primarily intended for the treatment of the sick poor, but in their development they had become of even greater importance as places of original research and for educating those who served the cause of health. While the hospitals were overcrowded the Poor-law infirmaries were half empty and not brought into relation to the rest of the health services. He hoped that all the hospitals and infirmaries would be coördinated for public welfare, and that ways and means would be secured from the insurance funds.

Major W. ORMSBY-GORE, M.P., in opening the discussion, said that one of the problems to be discussed was the administrative separation of preventive from curative medicine. The Poor-law system owed its origin to the reaction against a state of affairs that had been allowed to grow up since the reign of Elizabeth. The basis of the present

position was the Metropolitan Act of 1867, which established State-provided infirmaries, and as a result there were to-day in Poor-law institutions 94,000 beds. In London the beds in these institutions were more numerous than those of the voluntary hospitals. In order to bring about coördination legislation was necessary, but before that could be obtained public opinion would have to be developed both inside and outside of Parliament. There should be a general demand that not only should the Insurance Act, and all the work in connexion with that Act be brought into line with the work of voluntary hospitals and State-provided hospitals, but that all curative treatment should be considered as a whole. That would include private nursing homes. Whatever happened to voluntary hospitals the whole question must be made a national and not a local matter. It was vital to the progress of medical science that the voluntary system of hospital support should be autonomous and under the control of the Ministry of Health.

Prof. E. W. HOPE (M.O.H., Liverpool), while realising the good work that had been done by boards of guardians, said the infirmaries were not being utilised to their capacity and the voluntary hospitals were closing. It would be a disaster to the country if the voluntary hospitals were placed upon the rates.

Councillor WILSON (Liverpool) said it was a mistake to place the charge for the upkeep of voluntary hospitals on National Insurance funds. The money would have to be found either in higher charges upon incomes, or in complete reassessment of profits and so forth, and not out of the pockets of working people.

Mrs. BRYCE (Chairman of the Public Health Committee, Hackney) said that very little would be done until children and parents were properly housed, fed, and trained.

Dr. H. C. PATTIN (M.O.H., Norwich) thought that hospitals should be provided for directly from the Exchequer. The health of the people was the first consideration of the State.

Mr. H. L. WOOLLCOMBE (Secretary to the Charity Organisation Society) appealed for the continuation of the voluntary system, and hoped that a large number of the Approved Societies would follow the splendid example of the National Deposit Friendly Society in contributing towards these institutions.

Sir WILLIAM SMITH expressed the opinion that Poor-law hospitals should be made generally available for public use, the arrangements enlarged, and a staff of honorary medical officers added.

Miss MOTT said that the National Insurance Act was very unpopular because people did not get value for their money.

Dr. J. HOLROYDE (M.O.H., Chatham) shared the common feeling against State interference, but already, he said, the thin end of the wedge had been introduced; for public funds were received by hospitals, for school children, infants, maternity and child welfare centres, venereal treatment, and for other purposes. At the Chatham local hospital a scheme of graduated payments had been initiated with some success, and had received the support of labour and trade councils.

A representative of the National Labour Housing Council asked that a larger share of the management of hospitals should be given to the working classes or their representatives.

Mr. C. F. PEYTON BALY (British Dental Association) said it was not possible to separate preventive from curative work, and any scheme that was drawn up must take proper account of preventive medicine. Full provision would have to be made for the training of young doctors as well as for keeping qualified men up to date.

Councillor BULLEN (West Ham Board of Guardians) maintained that treatment in infirmaries was just as skilful as that given to patients in other hospitals.

The Housing Problem.

In the afternoon Sir GEORGE MCCRAE (Chairman of the Scottish Board of Health), who presided over the Session on the Housing Problem in its various bearings, said that at the present moment there was a world shortage of houses—it existed at home, in our colonies, all over Europe, in America, and in Asia. That house shortage was not due to the war, because, though the war had intensified the situation, there had been a great falling-off in house building all over the world before the war. He gave facts and figures in support of this view, and asked whether it was not a question for our legislators to consider whether they had really got to the root cause of the housing difficulties. While many grumbled at the slow progress that was being made in house building, those who knew the magnitude of the difficulties in the way realised that progress had been made. Having regard to falling prices and the augmentation of the supply of labour, he thought the future would see further and economic progress.

Colonel F. E. FREMANTLE, M.P. (Chairman of the Housing Committee of the London County Council), confining his remarks to London, dealt with the need for housing and the provision that had been made. The needs increased year by year. It was necessary to provide a margin of empty houses so as to supply accommodation for that portion of the population who moved in accordance with the constantly changing and developing needs of the community. Then there was the matter of overcrowding, the standard according to London County Council requirements being not more than two adult persons in one room. Quoting figures as to rents, he said the Government would have to bring out a new scheme for housing. Before the war the housing schemes under the County Council were self-supporting, and he maintained they should be self-supporting again; but, in the meanwhile, the Government must provide some money. The great insanitary areas that had long been known would have to be dealt with. The population of London should not be encouraged to go further away and provision should be made for new industries near to their houses.

Mr. TREVELYAN THOMSON, M.P., said it was an impossible proposition now to hold our hands from the housing scheme of 1919. There were suggestions that the need was not now so great. Deplorable conditions, he said, existed at Middlesbrough, 15 to 18 people living in two rooms. In the interests of morality, public health, and true economy he asked the Conference to say that there should be no cutting down of the housing programme.

Mr. TOM MYERS, M.P., and other speakers having taken part in the discussion,

Councillor WILSON and Mr. J. S. WHYBROW (Secretary of the Labour Housing Association) moved and seconded the following: "In view of the continued shortage of houses and the evils of overcrowding, this Conference expresses its opinion that in the interests of public health no relaxation should take place in the efforts which are being made to increase the immediate supply of houses." The motion, after some discussion, was carried.

Industrial Efficiency and Health.

At the morning session on June 3rd Lord LEVERHULME, the President, in an introductory address said that we must get things done or be undone. Nothing, however, could be done except on the basis of robust health. He thought that one of the secrets of past success in this country was the apprenticeship system. In these days close contact between master and men was impossible. The system of granting doles for unemployment was a pernicious one. There were only two periods in the life of a human being when allowances and doles could be wisely given—before about the age of 16 and after the age of 70. Any dole given for the better education and healthy upbringing of young people was good, and the country owed something to those who were past work; but

doles to the healthy and strong would prove a curse. On the mechanical side of production, in factories employers sought the aid of well-trained engineers, but for the most complex machine of all, the human worker, no educational engineers were employed.

Prof. E. L. COLLIS dealt with the necessity for greater attention in industry to the maintenance of efficiency and the prevention of ill-health. He said that it might fairly be claimed that the most important of all subjects had been specially referred to by the Duke of York when he said that industry had been carried on too long without thought of the workers' health. In the interests of production industry was generally quick to seize upon anything which made for increased output, and he maintained that attention to the vocational selection of the worker was a primary need for the prevention of ill-health. The State was taking steps to bring up healthy adolescents, so that they might be useful citizens and productive workers. Industry had a duty to maintain them in health and efficiency and must provide hygienic conditions of work in order to acquire a stable personnel, to increase efficiency, and to pay high wages out of good results. Medical supervision, which might take the form of a medical department in the establishments, was a sound investment, and was a means of maintaining efficiency and preventing ill-health. Facilities for convalescence among industrial workers were needed to expedite recovery, and when linked up with re-education, as was done by the Ministry of Pensions, could reclaim many useful workers from the ranks of the unemployable.

Mr. KENNETH LEE (Manchester Cotton Industry) said that far too much money was spent on hospitals for cure and far too little on prevention. Sufficient precaution, at any rate at an early age, was not taken to see that young people on entering a factory were suitable for the work to which they were put. Bad teeth, too, were a serious cause of ill-health.

Mr. J. HODGE, M.P., said that if Capital had done its duty towards Labour there would have been no necessity for discussion that morning. The worker must be treated not as a "hand" but as part of the organisation for the production of wealth.

Sir FREDERICK MILLS said that no nation could prosper when its industries were constantly subjected to sudden stoppages, for industry in these circumstances was incapable of properly carrying out its engagements. Population was dependent upon industry and not industry upon population. The history of this country showed that the population for centuries on had varied between five and ten millions. Sometimes we had our civil wars, and the population went down suddenly, gradually grew, and on the introduction of steam in the middle of the eighteenth century began to advance by leaps and bounds. Industry made population. There was only one cure for industrial unrest. The workmen should become shareholders in the companies they worked for. Working-men directors on the boards of the companies were needed.

Prof. Sir THOMAS OLIVER (Durham) said that efficiency in occupation could only be secured by the worker himself being healthy, and by labour being carried on under healthy conditions. The healthiest occupation was that which was carried on out of doors, as seen in the low mortality rates of the farming classes. In this respect the oldest occupation occupied the prime position.

Dr. H. M. VERNON (Investigator for Industrial Fatigue Research Board) agreed with all that had been said as to the importance of prevention of ill-health in the industrial workers and the effect of ill-health on efficiency. The results of investigation had shown that long hours and overwork produced sickness and inefficiency. There was a lack of investigators and many employers failed to realise the bearing of research work of the kind he referred to on health and therefore on efficiency.

Dr. RHODA ADAMSON (Clinical Lecturer in Obstetrics in the University of Leeds) recounted her experiences in examining and supervising women war-workers, which showed the advantage to employers of labour in regulating the employment of women by medical advice. From the point of view of health there was very great neglect among the working women of the country. Proper attention to eyes and teeth saved a great deal of sickness, while putting women on light work during pregnancy was economical both to master and worker.

Prof. F. SCHOOFS (Liége) pleaded for the establishment of a connexion between engineering and the medical sciences in the university curriculum.

Venereal Diseases.

The BISHOP OF BIRMINGHAM presided over a discussion on the present machinery for dealing with venereal diseases and the measures essential for effective prevention. He said that he could not understand the policy of the Ministry of Health in regard to venereal diseases, but he wished that the medical profession would show unanimity in their opinions. It would be a great help if the medical profession could pronounce whether disinfection before connexion was a certainty for the prevention of the disease. On the Committee with which he was connected there was difference of view, and the conclusion which the Government had reached was that, the evidence being contradictory, self-disinfection was not a certainty. He agreed that in a large proportion of cases it would not be quite satisfactory because the person who was using the method was not in a condition in which he—still more she—would be likely to take the proper precautions and do the right things. Discussing the moral and social aspects of the matter, he said that medical men appreciated the moral side of the question as well as the social, and pointed out that the disease was terribly destructive not only to the guilty but to the innocent.

Prof. E. W. HOPE said that though every facility was given in Liverpool for the treatment of venereal disease, there were great difficulties in the way of persuading those who had started treatment to continue with it. That led to a great waste of public money. Sixty per cent. of the patients attending the hospitals in Liverpool ceased to attend before they were free from infection. Of the patients attending at the Royal Infirmary there was a preponderance of men, a large proportion of whom were seamen, and among them many foreigners. The women patients formed about one-eighth of the whole. It was proposed to ask Parliament to consider a measure which would make larger provision for free treatment, would call upon those who were infected, and who knew it, to consult a medical man, and would impose on that medical man the duty of explaining to the patient the nature of the infection and the necessity for continuous treatment. Other provisions placed upon parents and guardians the duty of protecting, by medical guidance, young persons under their care.

Sir WILLIAM MILLIGAN (Lecturer on Diseases of the Throat and Ear in the University of Manchester) said that it was exceedingly difficult for any Government to act unless there was unanimity of medical opinion. This there would never be, but he thought the guiding principle should be the opinion of the majority. He did not believe that venereal disease would ever be swept out of any country. It would always exist to some extent, but a very great deal could be done to decrease its incidence and its ravages. Self-disinfection, in his opinion, was a snare, and often a cloak with a very great number of people for the continuance of vice. It was not practicable for the layman to disinfect himself, and particularly herself, without knowing a great deal about the anatomy of the parts. If the matter was going to be seriously tackled a large expenditure of money would be needed and provision would have

to be made for ensuring that people should attend at clinics until cured. Young men and women before going out into the world should be taught something of sex physiology, and it must be recognised that the incidence of venereal disease was very much mixed up with the drink question.

Dr. H. J. SEQUEIRA (London Hospital) did not agree that self-disinfection was useless, and pointed out that it was easier to disinfect the glans penis than the very delicate conjunctiva of an infant. He thought that the measures at present in use were effective so far as they could be effective.

Prof. WINIFRED C. CULLIS (University of London) pleaded in the interests of the Mercantile Marine for clinics at every port, the provision of recreational facilities for men who wished to keep straight, and for educational propaganda.

Colonel C. J. BOND (Vice-Chairman of the Consultative Council of Medical and Allied Services of the Ministry of Health) said that all would agree that the present machinery for dealing with the disease was certainly defective on the preventive side. The Government had not yet recognised the value of the influence of the group mind and public opinion.

Mrs. SCHARLIEB (Royal Free Hospital) pleaded for a stricter control in the upbringing of persons of both sexes.

Dr. F. N. KAY MENZIES (Public Health Department, London County Council), describing the scheme which was in operation by the London County Council in controlling the disease, said that something like 40 per cent. of the patients ceased treatment before they were out of the communicable stage. There were great difficulties in regard to providing treatment at times which would suit all kinds of people, and it was proposed to make arrangements so that the clinics might be open all day. The cost of treatment in 1917 had been £33,000; in 1918, £50,000; in 1919, £80,000; in 1920, £100,000; and this year it would probably reach £120,000.

Lord WILLOUGHBY DE BROKE said that it was obvious that, in spite of exhortation and treatment, the present methods were inadequate, and that there was an increasing charge upon the ratepayers and taxpayers of the country. Everything possible ought to be tried.

Lady BARRETT, representing the Federation of Medical Women, said that unless it could be proved that self-disinfection, as used by the layman, was successful, it was not right to teach young people that they could obtain immunity by so using them.

Dr. MARIE STOPES said that the only cure for the deplorable state of things which existed was early marriage and control of conception.

Industrial Tuberculosis.

The proceedings on Saturday consisted of a debate upon the efficiency of the present machinery for dealing with tuberculosis, at which Sir ROBERT PHILIP, Prof. LYLE CUMMINS, Sir G. SIMS WOODHEAD, Dr. JANE WALKER, and Dr. F. J. H. COUTTS (Ministry of Health) were the principal speakers.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.—At a meeting of this society held recently, with Dr. L. E. V. Every-Clayton, the President, in the chair, various modern clinical methods were demonstrated. Drs. Patrick and Eric Watson-Williams showed a number of patients to illustrate the use of the Otorhinoscope. Dr. J. O. Symes and Dr. Cecil Clarke exhibited the apparatus used in the Fractional Method of Gastric Analysis, illustrating its action on two students. Dr. Geoffrey Hadfield gave an account of a simple plan for the estimation of blood-urea, and demonstrated the apparatus. Dr. R. G. Gordon showed a tuning-fork apparatus for the quantitative estimation of vibration sense, with a series of charts illustrating the value of the method in the diagnosis of nervous disease. Dr. Gordon also showed a patient with aphasia and described the tests applied in accordance with Head's theory. Dr. C. E. K. Herapath gave a brief account of thePolygraph and Dr. Carey Coombs of the Electrocardiograph.

INDUSTRIAL MEDICINE:

A CONFERENCE OF PRACTITIONERS.

A MEETING of medical practitioners engaged in medical service at industrial undertakings, called together by the Industrial Welfare Society, was held in the council room of the Society at 51, Palace-street, Westminster on June 2nd. The Conference was opened by H.R.H. the DUKE OF YORK, President of the Society, who spoke of the importance of the movement and wished success to the deliberations.

Medical Service in Industry.

Dr. R. MCN. WILSON delivered the opening address, in the course of which he paid a tribute to the factory inspectors, who had been instrumental in removing the terrible conditions which formerly existed in our factories. If employers had listened to the factory inspectors and doctors, the trouble between labour and capital would have been healed 50 years ago. The work of fatigued or underpaid employees did not pay the employer. The medical profession was in an impartial position for demonstrating that the interests of capital and labour are identical. Here were enormous opportunities for industrial medicine. The human machine must be well "vetted." The medical profession should have a preventive outlook and adopt the "Mackenzie line of thought." Actual disease was an end process and we must study the processes which led up to it. Any successful system of industrial medicine must be based on the general practitioners who alone knew the conditions of the home and family and who alone had the necessary influence to convince his patient as to the need for following advice (for the benefit of his health) which often seemed distasteful.

Dr. T. M. LEGGE, of the Home Office, insisted that all industrial welfare work must be based on medicine. The movement for industrial "doctors" was only in its infancy. He would like to put some questions to the meeting. What was the relation of the "works doctor" to the panel doctor, to the certifying factory surgeon, to the welfare superintendent, and to the Whitley Councils? Could they have a panel of works doctors, or could part-time industrial work be linked up with the panel system? Were there clinics established in the works, ophthalmic, dental, &c? Could they show to the employer results in £ *s. d.* from industrial medicine? They were committed to the insurance system for weal or for woe. Medical examination of employees by the firm's doctor was not feasible, but might be done by State doctors, as under the present panel system. In the U.S.A. they had no insurance system to retard the spread of industrial medicine.

Dr. ARTHUR SELLERS pointed out that the certifying factory surgeon had not time to examine children properly. He (Dr. Sellers) had a panel himself. His practice was to examine selected cases in the ambulance room of the works and then refer them to their panel doctor. The panel doctor had no means of suggesting suitable employment for his patient. Certifying factory surgeons must have more time to do their work and should work more in touch with the industrial welfare doctor.

Dr. E. E. MATHER stated that he and a woman doctor worked "whole time" for Messrs. Cadbury. There were about 9000 employees,1000 being under 16. They treated all who came for treatment, men, women, and children, and had no difficulty with the panel doctors. They had a dental clinic and the firm paid for special cases to be sent to hospitals and consultants. He had had two years' experience, but wished a special course of training had been available for him before taking up the work. The medical examination of existing employees was optional, but the examination of applicants was compulsory. There were very few rejections, not more than 1 per cent. perhaps. Some would be admitted conditionally on submitting to an operation for tonsils or obtaining a truss for hernia.

Dr. WILSON in his reply said the backbone of the whole system of medicine was the general practitioner. They must interest the general practitioner and bring him into the scheme of industrial medicine.

Health Problems in Industry.

At the afternoon session, Prof. E. L. COLLIS gave the opening address. He pointed out how welfare work had grown as the result of the war. In 1913 they could only muster about 20 welfare supervisors at a conference at York. There was no reason why medical service in factories should not grow equally rapidly, but propaganda work amongst employers was necessary. Medicine could save industry millions a year by preventing break-downs, lost time, by finding workers jobs suited to their health, and by making the jobs more healthy for the workers. Miners' nystagmus, lead poisoning, anthrax, and phosphorous poisoning were comparative rarities—the things they wanted to prevent were bronchitis and phthisis. The question is what is the best way of convincing industry of its needs.

Dr. E. HALFORD ROSS instanced a firm of printers doing fine work which saved thousands a year by employing an ophthalmic surgeon. Medical supervision should go right through industry.

Dr. R. E. CREE showed graphs illustrative of accidents to groups of workers at the shipyard of Swan Hunter and Wigham Richardson. Boys, of course, had the most accidents. Old men were often disabled permanently by very trifling accidents, and suitable non-dangerous work should be found for them. He attended the ambulance room and treated accidents only for the firm. He knew that he saved the firm a great deal of money by preventing sepsis. There ought to be a system by which convalescents could do half time or light work suited to their condition.

Sir THOMAS OLIVER pointed out, as £ *s. d.* gain, that the match industry was now free from jaw and dental trouble. He thought there should be a State department for industrial medicine, as in France and U.S.A. Half-time work for convalescents would be very valuable.

Dr. J. R. KERR, of St. Helens, spoke of the sheet and plate glass industry. Since 1907 the Pilkington firm had given him great support in finding medical equipment. The hospital was largely self-supporting. Firms and insurance companies paid towards the cost.

Dr. M. W. RENTON, who had worked for Vickers, mentioned that this firm had a hospital and special clinics for electro-therapeutics and massage, &c., and that insurance companies send patients for treatment. The certifying factory surgeon should never be the "works doctor." The practitioners on the panel were often very hazy as to the exact occupation when they signed certificates and should attend the works clinic.

Dr. T. L. LLEWELLYN said that two years ago he got the North Staffordshire coal-owners to set up a massage centre. They had an attendance of 200 a week and had obtained very satisfactory results. He always wrote to the family doctor informing him that he was going to give his patient a course of treatment. He was certain the centre had more than paid for itself by getting men "fit" more quickly.

Dr. D. A. COLES acted as "works doctor" for the Gas Light and Coke Co. He was not on the panel himself, and had no difficulty with the panel practitioners. The men were always willing to be overhauled because they knew it was in their own interest. He endeavoured to get the cases early, examine eyes, provide trusses for hernia, &c. He hoped to get his firm to assist in dentistry and the provision of spectacles.

Mr. SEEBOHM ROWNTREE said that his firm had a works' doctor, a dentist assisted by mechanics, and an oculist. The cost was comparatively trifling, £2000 on a wage bill of £1,250,000. The establishment of a clinic was not costly like that of a canteen. Probably the Industrial Welfare Society would be the best body to do the propaganda work as to the value of medicine to industry.

Mr. R. R. HYDE, the Director of the Society, asked the meeting at the close to formulate a scheme for the continuation of the campaign initiated by theday's work.

Ultimately Dr. COLES, Dr. MATHER and Flight-Lieut. F. J. P. SAUNDERS were appointed a small sub-committee to draw up a programme to be put before another conference in connexion with the Summer School of the Industrial Welfare Society, which is to be held at Balliol College, Oxford, in September.

HYGIENE ON THE SEA.

ACCOMMODATION FOR SEAMEN IN SHIPS OF TO-DAY.

(BY OUR SPECIAL CORRESPONDENT.)

VII.—P. & O. MAIL STEAMER.

A P. & O. mail steamer, ready to embark her passengers and go to sea, lies comparatively unnoticed among the other great ships at Tilbury, and that just shows how big is London, how small relatively are the great Eastern ports of the world. Here the ship is hardly noticed. At the other end of her voyage the whole port will be interested in her. Her arrival with the English mail, the London papers, passengers primed with the latest gossip from home, and the trunks of some of them full of the newest fashions, has been eagerly expected, and the day she does come in is something of a holiday, at any rate a "festa," even in Bombay or Hong Kong, busy ports that they are. London has a mail day every day, and the docks, though they stretch for 20 miles along the river, are far from the town or else perhaps the hard conditions of the sailors' life might sooner have been improved. Slums in Drury-lane are visible, and their cry for improvement is heard, slums beyond Wapping, who shall know of them.

It was by the kind permission of the P. & O. Company that I was recently taken down to Tilbury, on behalf of THE LANCET, by Dr. Arnold Chaplin, medical superintendent of this and other companies, to see their ship *Malwa*. She was built ten years ago; her gross tonnage is 10,941; she can carry some 6000 tons of cargo, and has accommodation for 285 first- and 127 second-class passengers, 412 in all; she is 540 ft. long, 61 ft. broad, and draws 27 ft. when loaded. She has a ship's company of 340, of whom 101 are lascar firemen, 51 lascar sailors, and 67 Goanese stewards. The large saloon, kept cool by electric fans, and the spacious music saloon, the ladies' card-room, &c., make the travellers comfortable, while the large deck area outside shows the ship is built for the tropics, and to get for her passengers all the coolness there may be. The cabins are of the usual pattern, and of them we need only say they have electric fans for hot and electric radiators for cold weather, and as to the cuisine its excellence is well known, and accounts in part for the eagerness that people in the ports abroad manifest in the P. & O. ships.

Accommodation of the Crew.

As to the accommodation of the crew, which is what interests the readers of THE LANCET, there can be about *Malwa* only a good report. The officers are berthed above the promenade deck, the white crew forward in the forecastle. These last are all petty officers, and live in cabins with two, three, or six beds. The beds are spring beds with hair mattresses, and for each man there is a locker. I would have liked to see a shelf or two and some hooks for clothes instead of the nails there were, but bright brass knobs to some of the bed frames gave an unusual appearance of cheerfulness and comfort. The lavatories and baths (earthenware) were good and numerous, salt water the only supply to baths,

here as throughout the ship, but fresh water for the lavatory basins. No ship with so many passengers could carry fresh water enough for full length baths in the tropics for even a fortnight's run, let alone for four weeks. Forward also are berthed the Goanese stewards, in a sleeping deck with double-tiered cots, and I should say 120 cubic feet per person. Hot it would be, every place in a ship in the tropics is hot, but I was very glad to see that the ten windows, ports, or scuttles were fitted with Utley's patent ventilating sidelights, which allow air to come in, though they keep water out absolutely [1] and are consequently of the greatest use in the monsoon weather, when seas are rough and ordinary ventilators are closed. They cost twice as much as the ordinary sidelights and are twice the weight, but they are a great comfort to those who live near them in bad weather, and one cannot but feel obliged to the company which has had them fitted in a crew space, evidencing its consideration for its employees. Nobody who is unacquainted with the poisonous atmosphere which develops in a crowded crew space in warm, neavy—i.e., bad—weather in the tropics can imagine the comfort it is to have "the fug" diluted with even a trickle of fresh air from the outside. I was told here, as usual, that these Utley sidelights never go wrong. These 61 Goanese stewards have about a dozen wash-basins, white earthenware, small square troughs, useful also for washing clothes, with fresh water taps over them; their baths were as already described, and their water-closets were good, pedestal closets, with lifting seats that could be, and had been, scrubbed; all were clean—the ship was to sail next day—and they were separated from one another by light wooden partitions. In each of the cells thus formed was a box for latrine paper; two boxes were deficient, and there was no paper in any of them, but at present the ship was in dock and the water-closets were officially not in use. All these w.-c. compartments were painted white throughout, and in all were a couple of sidelights to four closets. Quite good this installation, and better than that found in the ocean giants.

Next comes the accommodation for the first-class passengers already touched on, and further aft, the second-class saloon, smoking-room, music-room, &c., and further aft again, separated on every deck by a bulkhead (i.e., a partition), is the accommodation for the native crew, better than any I have hitherto travelled with, but I have never travelled in so large a ship with a native crew. Being aft they are deeper down in the ship, but that has advantages. They were stated to have, each of them, 140 cubic feet of space, but I was not, I think, assured that that figure was the result of exact measurement, with deduction of encumbrances. The space they had was any way larger than would probably have been given to invalid soldiers in a hospital carrier, and was arranged in double-tiered iron berths, the fittings used being very similar to those used in hospital ships. There was cork paint on the iron overhead and on the frames and webs, but not on the iron plates of the ship's side, which besides were not wood cased; still the iron berths did not touch the ship's side, and no bed could be wetted by the water running off the side when the iron sweated in cold weather. There are ventilators of supply and exhaust to cowls on the decks above—there is no artificial ventilation; in cold weather temperature is raised by small coal stoves. This ship is ten years old, and steam heating is installed in the newer ships built during and after the war. There are, I am told, washing places for the lascars, and I did see a latrine for them, but the plans for latrines for natives that were on board *Achilles* [2]—cement gutters on the deck which could be flushed from a tap—were to be preferred. At the after end of the lascars' deck is a railed-off section for sick lascars taking passage as invalids—lying-down cases, but not infectious. Now this is a great comfort.

[1] THE LANCET, 1902, i., 1597.
[2] THE LANCET, 1920, ii., 1110.

Medical Arrangements.

As regards the medical arrangements of the ship, there is on the boat deck, over the promenade deck and not accessible to any passenger, an infectious hospital, which, considering it has to deal with such cases for a population of 750 only, would appear to be quite sufficient. Two four-berth cabins, one to starboard, one to port, one for men, one for women, each with bath, washing-basin, water-closet, steam radiator, fan, and portholes. Alongside is a cabin for an attendant. This is a very satisfactory installation. The crew will also be isolated up here, but natives with their own straw mattresses and bedding, Europeans with the usual cabin equipment. In the newer and larger ships this boat deck extends over the whole of the ship to the stern, and the infectious hospital is moved to the after end, a plan which has much to recommend it, and to which I see no objection. The medical staff is a surgeon, with him a steward he has trained, and in future another steward is to be added for the infectious hospital. (Naval medical officers will be glad to know I heard something about a pensioned naval sick-berth steward being possibly the first.) The surgeon is placed at the starboard after corner of the first-class passengers' accommodation, where he is readily accessible to first- and second-class passengers and to the crew. He has here a hospital of two two-bed wards, with, for each, the usual annexes. The dispensary, large, well lighted, and well supplied, is between his cabin and the hospital. Here is an operating table, which can be rapidly set up and securely fastened to the floor; a sufficient stock of instruments is supplied by the company, and in this ship was a most useful piece of equipment, a carrying chair—a great help to the surgeon, for many sick people take passage in the P. & O. from year to year (there are more deaths amongst the passengers than amongst the sailors of the line)—and one can always extemporise a carrying chair, but the results of prevision are habitually superior. Next door to the dispensary, and communicating with it, is the surgeon's commodious cabin. It is his duty to examine the crew when they join (assisted by the dock surgeon of the company, as it were a D.A.D.M.S.), he sees the sick, and he has to know what is happening, and to answer the many questions propounded to him by the various port medical officers who come on board. Also I found, when a ship's medical officer, I was a buffer state between the captain and troublesome lady passengers. The post is responsible, and at times of epidemics anxious, but in a P. & O. mail steamer, what with the variety of the ports visited, the moderate weather of the region in which they sail, the society of the officers and passengers, and the table the company spreads, it is an employment with many compensations, and at present extremely popular. Employment under the P. & O. is for the officers continuous, for the surgeon pretty much the same, while the crew sign on for each trip separately, but are really employed continuously so long as they do not get themselves disliked or invalided, and I should say that any seaman might be pleased to go to sea in the *Malwa*.

Morbidity and Mortality on Board Ship.

I was taken over this ship by the experienced medical superintendent, and I have voyaged in others of this line; those ships were smaller, this was larger and better, and I hear of better existing beyond. The management seems to me to be more sympathetic than formerly, more anxious to give its servants better conditions than it was 20 years ago, and it gives them in this ship accommodation that is quite up to and indeed ahead of that customary in the merchant service of to-day. It would be absurd to ask the company to make alterations here and now, when losses on passenger voyages are

being counted in tens of thousands of pounds, and giant liners are being laid up, and they tell me down the Commercial-road that if 20 men are wanted for a ship the shipping office is swamped by 200 eager applicants. Most men would rather take a chance of death by phthisis in five years than a large probability of death by starvation in five weeks. Better to have a slightly imperfect ship running than no ship at all and 400 sailors more out of work. Yet there is advantage in considering these questions and discussing any "leading" that may seem to emerge.

Recent statistics of illness and deaths of sailors in the Eastern trade were brought by Dr. Arnold Chaplin before the Epidemiological Section of the Royal Society of Medicine in February.[1]

The figures are shown in the table which follows.

Comparative Illness and Death-rates of Sailors in the Eastern Trade: (A) Lascars; (B) Europeans.	(A)	(B)	(A)	(B)
	Per 1000.		Relative proportions.	
General death-rate, 1912	5·4	3·5	154	100
In 16 years in the Eastern trade, general death-rate	4·2	2·6	161	100
Pneumonia, mortality	0·8	0·3	266	100
Phthisis, attack-rate	5·0	2·0	250	100
,, mortality	0·47	0·14	335	100

That is, natives have a liability to disease in the Eastern trade 61 per cent. greater than that of Europeans; to death from pneumonia, 166 per cent. greater; to attack by phthisis, 150 per cent. greater, and to death from phthisis, 235 per cent. greater than that of white sailors in the same ships. Probably the white sailors are older, and we have no account of the relative ages, or of the age-distribution of the illnesses. Of course it may be easily asserted that the difference is due to a congenital lesser resistance of the natives to disease. Such an explanation rises easily to the lips, and is difficult of disproof. Not otherwise, 30 years ago, did people ascribe to climate diseases since learned to be attributable to mosquitoes, trypanosomes, or ankylostoma. Not otherwise, in the older days, were cases of typhoid fever being described in service reports as "due to infection on leave," yet were, I noticed, becoming steadily fewer and fewer, as more careful attention was being paid to men's life when on duty. Take phthisis, 5 per 1000 natives were attacked, but only 2 per 1000 Europeans. Let it be noticed that the European crews have better ventilated quarters, and with more isolation. There are some 100 lascar firemen in this unusually well-ventilated ship, in a single compartment, with 140 cubic feet of space to each, good beds, and four large (let us say 18 inches diameter) ventilating shafts and many portholes. A case of phthisis introduced has a great opportunity to spread, though lessened by the quite tolerable ventilation. Still the bacilli have a chance to find a suitable nidus among the 20 men around, but in a white man's cabin forward, with two, three, or six beds, the chances in its favour would be fewer, the better ventilation of cabins higher up in the ship being always remembered as well.

Further Development in Ventilation.

This company has made great advances, but *Plus ultra* is a motto that cannot be unknown to those who sail through the Pillars of Hercules and handle Mexican dollars. Clearly a ship is coming in which ventilation is given thorough examination. What strikes one so much is the little use that is made of the "wild heat" from the boilers and engine-rooms. That is a waste product, and like so many others in industry is being thrown away. It should be used to ventilate all the central part of the ship; but look how tiny are the openings generally found on the boat deck. Old men-of-war were ventilated into the funnel casing—there is no funnel casing nowadays. But the ends of the ship must have artificial ventilation, and this should have been in mind from the time the first sketches of the ship were made. Artificial supply, artificial exhaust, as in *Olympic*, the best ventilated ship I have seen, with one funnel exclusively a ventilation exhaust. Ventilation is the great problem of healthy life in ships. It will reduce the cubic space necessary for the men, at the same time making them more comfortable; it will thereby release to the owners more space to be income-earning. The great advances at sea these 30 years are iron ships, without leaks replacing wood, and electric light replacing candles and lamps. Electric light means that steam is always up, and so ventilation can always be maintained; that will get better work out of the crew, and it can be applied to holds when cargo is being worked; that will mean quicker stowage, and quicker despatch for the ships. Also there must be an engineer told off to watch the ventilation, to keep it running properly, to write up a log, and make reports which will show the captains that the companies think that ventilation is important. Then it will be always satisfactory. It is a thousand pities that the Naval Medical Department, with its vast experience, does not put out a book on the ventilation of ships to be a guide to all ship constructors and managers, and to improve the health of passengers and crews of our island nation. It might well copy the publicationary zeal of the sister service.

Meanwhile, as regards the P. & O. Company, it is clear that the owners are showing themselves considerate, that their newer ships are well arranged, that their newest are better still, and that in future, when others are built, they will surely maintain their standard, a high standard as one is glad to witness.

[1] THE LANCET, March 19th, 1921.

BRITISH MEDICAL ASSOCIATION:
ANNUAL MEETING.

THE eighty-ninth annual meeting of the British Medical Association will be held at Newcastle-on-Tyne, where the sixty-first annual gathering met in 1893. On Friday, July 15th, the Annual Representative Meeting will open at 10 A.M., and be continued on the following days. Other arrangements are as follows: Friday, July 15th, at 7.30 P.M., Representatives' Dinner; Tuesday, July 19th, 2 P.M., Annual General Meeting; 5 P.M., Religious Services; 8 P.M., Address by the President, Prof. DAVID DRUMMOND, and Adjourned General Meeting; Wednesday, July 20th, 2 P.M., Conference of Secretaries; 6.30 P.M., Secretaries' Dinner: 8 P.M., Special Address on Industrial Medicine by Sir THOMAS OLIVER; Thursday, July 21st, 7.30 P.M., Annual Dinner of the Association: Friday, July 22nd, 7.30 P.M., Popular Lecture on "Evolutionary Wounds," by Sir ARTHUR KEITH. The 17 sections will conduct their discussions on one, two, or all of the following days: Wednesday, Thursday, and Friday, July 20th, 21st, and 22nd. The sections will meet from 10 A.M. to 1 P.M.: laboratory and clinical demonstrations will be given between 3 P.M. and 4.30 P.M.

Section of Medicine.

President: Prof. Thomas Beattie; Vice-Presidents: Lord Dawson of Penn, Prof. A. J. Hall, Dr. G. S. Haynes, Dr. J. Wilkie Smith; Hon. Secretaries: Dr. C. E. Lakin (105, Harley-street, London, W. 1); Dr. W. T. Ritchie (14, Rothesay-place, Edinburgh); Prof. W. E. Hume (4, Ellison-place, Newcastle-on-Tyne).

Provisional Programme.—July 20th, 10 A.M.—Discussion: Visceral Syphilis, especially of the Central Nervous System and Cardio-Vascular System: to be introduced by Sir Clifford Allbutt. July 21st, 10 A.M.—Discussion: Asthma and Allied Disorders: to be opened by Sir Humphry Rolleston. July 22nd, 10 to 11.30 A.M.—Discussion: Encephalitis Lethargica: to be opened by Dr. Edwin Bramwell; 11.30 A.M. to 1 P.M.—Discussion: Renal Efficiency Tests: to be opened by Prof. H. Maclean.

Section of Surgery.

President: Prof. J. Rutherford Morison; Vice-Presidents: Prof. H. Brunton Angus, Mr. Arthur Cooke, Mr. W. J. Greer, Dr. A. M. Martin; Hon. Secretaries: Mr. W. Girling Ball (77, Wimpole-street, London, W. 1); Mr. J. M. Renton (16, Sandyford-place, Glasgow, W.); Mr. G. Grey Turner (The Hawthorns, Osborne-road, Newcastle-on-Tyne).

Provisional Programme.—July 20th, Morning Session.—Discussion: Acute Pleural Empyema: to be opened by Mr. Henry Wade. At 3 P.M., demonstrations by Prof. Rutherford Morison at the War Pensions Hospital of cases and specimens illustrating (1) Bipp, (2) Bone Cavities, (3) Bone Grafts. July 21st, Morning Session.—Discussion: Compound Fracture of the Thigh and Leg. At 3 P.M., demonstrations at the Royal Victoria Infirmary of cases and specimens, illustrating Compound Fracture of the Thigh and Leg. July 22nd, Morning Session.—Discussion: The Diagnosis and Treatment of Injuries of the Intestines: to be opened by Mr. Gordon Taylor. At 3 P.M., demonstrations by Mr. G. Grey Turner at the Royal Victoria Infirmary of six cases of implantation of the ureter into the bowel.

Section of Pathology and Bacteriology.

President: Prof. Stuart McDonald; Vice-Presidents: Dr. J. F. Gaskell, Dr. James A. Murray, Prof. Matthew J. Stewart; Hon. Secretaries: Dr. R. R. Elworthy (West London Hospital, Hammersmith, London, W. 6); Dr. A. F. Bernard Shaw (Pathological Department, College of Medicine, Newcastle-on-Tyne).

Pathological Museum.—It is proposed to gather together a series of exhibits illustrating the pathology of individual cases. The Pathological Museum Committee will arrange the material under the following heads: (1) Exhibits bearing on discussions and papers to the various sections; (2) specimens and illustrations relating to any recent research work; (3) instruments relating to clinical diagnosis and pathological investigation; (4) individual specimens of special interest or a series illustrating some special subject. Interesting specimens will be welcomed. The Hon. Secretary of the Committee is Dr. A. F. Bernard Shaw.

Section of Preventive Medicine with Industrial Diseases.

President: Sir Thomas Oliver; Vice-Presidents: Sir Josiah Court, Dr. T. Eustace Hill, Dr. I. G. Modlin; Hon. Secretaries: Dr. C. M. Wilson (64, South Audley-street, Grosvenor-square, London, W. 1); Dr. W. H. Dickinson (1, Ridley Villas, Newcastle-on-Tyne).

Provisional Programme.—July 20th.—Discussion: The Effect of Health Legislation on the Health of the People. July 21st.—Discussion: The Importance of Industrial Medicine to the Community: to be introduced by Prof. E. L. Collis, followed by Dr. T. M. Legge. July 22nd.—Joint meeting with the Section of Medicai Sociology.

Section of Orthopædics and Diseases in Children.

President: Mr. A. H. Tubby; Vice-Presidents: Mr. R. C. Elmslie, Dr. H. Morley Fletcher, Dr. Lachlan G. Fraser, Sir Henry M. W. Gray, Mr. A. E. Morison; Hon. Secretaries: Mr. C. Max Page (134, Harley-street, London, W. 1); Dr. Frank Hawthorn (10, Ellison-place, Newcastle-on-Tyne); Dr. H. R. Souper (Ministry of Pensions Hospital, Castle Leazes, Newcastle-on-Tyne).

Preliminary Programme.—July 26th, 10 A.M.—Discussion: The Early Diagnosis and Treatment of Anterior Poliomyelitis. July 21st, 10 A.M.—Discussion: Blood Diseases in Children. July 22nd, 10 A.M.—Discussion: Tuberculosis of Bone: General Principles of Treatment.

Section of Neurology and Psychiatry.

President: Prof. A. W. Mackintosh; Vice-Presidents: Dr. A. Helen A. Boyle, Dr. E. Farquhar Buzzard, Dr. Harry Campbell, Dr. Horsley Drummond; Hon. Secretaries: Dr. Anthony Feiling (41, Devonshire-street, London, W.); Dr. George Hall (1, Eslington-road, Jesmond-road, Newcastle-on-Tyne).

Provisional Programme.—July 20th, 10 A.M.—Discussion: The Diagnosis and Treatment of Borderland Cases: to be opened by Prof. G. M. Robertson and Dr. James G. Collier. July 21st, 10 A.M.—Papers.

Section of Ophthalmology.

President: Prof. J. D. Wardale; Vice-Presidents: Dr. H. P. Bennett, Lieut.-Col. R. H. Elliot, Dr. Harry M. Traquair; Hon. Secretaries: Dr. N. B. B. Fleming (9, Harley-street, London, W. 1); Mr. Stanley Robson (Miltonhouse, Rowlands Gill, Co. Durham).

Provisional Programme.—July 20th, 10 A.M.—Discussion: The Causes and Prevention of Blindness: to be opened by Mr. Bishop Harman. July 21st, 10 A.M.—Discussion: The Treatment of Corneal Ulcers: to be opened by Mr. J. V. Paterson.

Section of Oto-Rhino-Laryngology.

President: Dr. G. William Hill; Vice-Presidents: Dr. R. Gordon Bell, Dr. James Don, Dr. Dan Mackenzie; Hon. Secretaries: Mr. Lionel Colledge (22, Queen Anne-street, London, W. 1); Dr. W. Frank Wilson (97, Jesmond-road, Newcastle-on-Tyne).

Provisional Programme.—July 20th, 10 A.M.—Discussion: Problems in connexion with the Early Diagnosis and Treatment of Meningitis occurring in Aural Cases: to be opened by Sir Charles Ballance. July 21st, 10 A.M.—Discussion: The Various Problems presented by Hæmorrhage occurring in connexion with Operations on the Tonsils.

Section of Physiology, Pharmacology, Therapeutics, and Dietetics.

President: Dr. H. H. Dale; Vice-Presidents: Prof. A. V. Hill, Prof. John C. Meakins, Prof. J. A. Menzies, Dr. Alfred Parkin; Hon. Secretaries: Dr. O. Inchley (Babraham, Cambridge); Miss Mildred Atkinson (College of Medicine, Newcastle-on-Tyne).

Provisional Programme.—July 20th.—Paper by Prof. Hill: The Use of the Hot Wire for Investigating (*a*) the Time Relations of the Pulse; (*b*) the Characteristics of Voluntary Contractions in Man. Paper and demonstration by Prof. J. A. Menzies, Miss Atkinson, and G. A. Clark: The Passage of Sulphate through the Cells of the Tubules of the Kidney of the Frog. Paper by Dr. Dale: Anaphylatoxin. July 21st.—Paper, with lantern demonstration, by Dr. H. Muir Evans: The Poison Organs and Venoms of Venomous Fish. Paper by Prof. C. H. Browning: Recent Work on Chemotherapy. Paper by Dr. G. Arbour Stephens: Acid Feeders. Paper by Dr. Sim Wallace: Physiology of Oral Hygiene. July 22nd.—Joint discussion with the Section of Medicine on Tests for Renal Efficiency.

Section of Venereal Diseases.

President: Col. L. W. Harrison; Vice-Presidents: Dr. James Charles Buckley, Mr. Charles Gibbs, Dr. Mary Raw; Hon. Secretaries: Mr. Kenneth M. Walker (86, Harley-street, London, W.); Dr. James Hudson (42, Crossley-terrace, Newcastle-on-Tyne).

Provisional Programme.—July 20th, 10 A.M.—Treatment of Syphilis in Man, by Dr. R. MacKenna; Syphilis in Women and Children, by Prof. Walter Swayne. July 21st, 10 A.M.—Treatment of Gonorrhœa in Men, by Dr. David Lees; The Standard of Cure in Gonorrhœa, by Mr. Townley Clarkson. In the afternoon of Wednesday, July 20th, a demonstration will be held of Methods of Diagnosis and Treatment in Venereal Diseases, Dark-Ground Illumination Work, Models of Venereal Disease Clinics, &c.

Section of Obstetrics and Gynæcology.

President: Prof. R. P. Ranken Lyle; Vice-Presidents: Lady Barrett, Dr. W. R. Grove, Mr. William Robinson; Hon. Secretaries: Mr. Gordon Ley (5, Wimpole-street, London, W. 1); Dr. Mabel R. Campbell (49, Wingrove-road, Newcastle-on-Tyne); Dr. E. Farquhar Murray (52, Jesmond-road, Newcastle-on-Tyne).

Provisional Programme.—July 21st, 10 A.M.—Discussion: The Rôle of Cæsarean Section in Midwifery: to be opened by Dr. Eardley L. Holland and Dr. J. M. Munro Kerr. Paper: The Treatment of Advanced Malignant Disease of the Cervix, by Dr. Arthur Burrows, to be followed by a discussion. July 22nd, 10 A.M.—Discussion: The Neurasthenic Element in Midwifery and Gynæcology: to be opened by Dr. Archibald Donald and Dr. Farquhar Buzzard. Papers to be followed by discussion: (1) Curettage, (*a*) Diagnostic, (*b*) Treatment of Uterine Hæmorrhage, by Mr. H. Beckwith Whitehouse; (2) The Position of the Medical Practitioner called in to attend a case of Procured Abortion, by Dr. John Campbell.

Ambulance and Red Cross Section.

President: Sir James Cantlie; Vice-Presidents: Dr. Robert Anderson, Sir G. T. Beatson, Major-General Sir G. J. H. Evatt, Rev. C. F. Townley; Hon. Secretaries: Lieut.-Col. R. M. Vick (The Warden's House, St. Bartholomew's Hospital, London, E.C. 1); Dr. H. L. Rutter (31, West-parade, Newcastle-on-Tyne).

Section of Proctology.

President: Mr. J. P. Lockhart-Mummery; Vice-Presidents: Dr. Henry B. Densham, Mr. Ernest Miles, Mr. D. P. D. Wilkie; Hon. Secretaries: Mr. Cecil W. Rowntree (9, Upper Brook-street, London, W. 1); Mr. Hamilton Drummond (6, Saville-place, Newcastle-on-Tyne.)

Provisional Programme.—July 20th.—Discussion: Surgical Treatment of Internal Hæmorrhoids, to be opened by Sir C. Gordon Watson and Mr. D. P. Wilkie.

Section of Dermatology.

President: Dr. John Farquhar Christie; Vice-Presidents: Dr. Ernest Dore, Dr. Arthur D. Heath, Dr. D. Wells Patterson; Hon. Secretaries: Dr. William Jenkins Oliver (58, Queen Anne-street, London, W. 1); Dr. Sydney Thompson (19, Windsor-terrace, Newcastle-on-Tyne).

Provisional Programme.—July 21st, 10 A.M.—Discussions: (1) Cutaneous Sensitisation and Focal Sepsis in the Ætiology of Certain Skin Affections: to be opened by Dr. H. W. Barber; (2) The Association of Skin Tuberculosis with Visceral and other Tuberculous Manifestations: to be opened by Dr. George H. Lancashire; (3) Dermatological Cases attending the Pensions Boards: to be opened by Dr. Henry MacCormac.

Section of Medical Sociology.

President: Sir Jenner Verrall; Vice-Presidents: Dr. Charles Buttar, Dr. A. C. Farquharson, Dr. E. Rowland Fothergill; Hon. Secretaries: Dr. J. F. Walker (Rocklands, Clifton-terrace, Southend-on-Sea); Dr. Mabel G. Brodie (Maternity and Child Welfare Offices, 42, Old Elvet, Durham).

Provisional Programme.—July 22nd, 10 A.M.—Discussion: Relation of the Medical Profession to Local Authorities in respect to Rate-provided Hospitals and Clinics.

Section of Radiology and Electro-Therapeutics.

President: Dr. Robert Knox; Vice-Presidents: Mr. W. Hope Fowler, Dr. Robert Edward Howell; Hon. Secretaries: Dr. James Metcalfe (123, Harley-street, London, W. 1); Dr. Thomas Lowe Bunting (6, Portland-terrace, Newcastle-on-Tyne).

Provisional Programme.—July 22nd, 10 A.M.—Discussion: On the Changes induced in Blood Constituents by Radiations: (*a*) Experimental Evidence, Prof. Sidney Russ and Dr. Archibald Leitch; (*b*) Clinical observations, Dr. Mottram, Dr. Gamlen, Dr. J. B. Waters, Dr. Metcalfe, Dr. Hope Fowler, and others. On Morbid Conditions of the Blood: (1) The Anæmias, (2) Leukæmia, (3) Banti's Disease, &c. Opening paper by Prof. G. L. Gulland. Discussion on Surgical Diathermy, to be opened by Dr. Cumberbatch. A visit will be paid to the X ray and electrotherapeutic department of the Royal Victoria Infirmary, Newcastle-on-Tyne.

Section of Urology.

President: Mr. J. W. Thomson Walker; Vice-Presidents: Dr. P. J. Cammidge, Mr. John Clay, Mr. H. C. Pearson; Hon. Secretaries: Mr. Sydney G. MacDonald (51, Queen Anne-street, London, W. 1); Mr. W. S. Dickie (Ardencapel, Southfield-road, Middlesbrough).

Provisional Programme.—July 22nd, 10 A.M.—Discussion: The Diagnosis and Treatment of Cystitis: to be opened by Mr. J. F. Dobson. Papers: Experimental Evidence Bearing on the Source of the Amylolytic Ferment in the Urine, by Dr. P. J. Cammidge; Open Prostatectomy, by Mr. J. W. Thomson Walker; Treatment of Bladder Growths, by Mr. Sydney G. MacDonald.

The Honorary Local General Secretary of the meeting is Mr. R. J. Willan, M.V.O., O.B.E., F.R.C.S., 6, Kensington-terrace, Newcastle-on-Tyne.

THE WELSH NATIONAL SCHOOL OF MEDICINE.

MEDICAL interest attaches to the installation of the Prince of Wales as Chancellor of the University of Wales in succession to his father. The laying of the foundation-stone of the new Institute of Preventive Medicine, and the formal opening of the physiological buildings, recalls the fact that both these buildings owe their existence to the same generous benefactor, Sir W. J. Thomas. The new institute should be unique in the medical schools of this country. It is to house the public health laboratories of Glamorgan and the City of Cardiff, and provide accommodation for teaching and research for the Mansel Talbot Professor of Preventive Medicine, Dr. E. L. Collis, whose chair was endowed a few years ago by the late Miss Talbot. The establishment of this department also owes much to the interest taken in it by the late Sir William Osler and to the advice he gave; he saw a great opportunity for the development of preventive medicine in connexion with the Welsh National School of Medicine. This medical school at this moment is at an interesting stage. For some 30 years the school has been in existence at Cardiff, but hitherto has not carried teaching beyond the anatomy and physiology stage; its students have gone elsewhere to obtain clinical teaching. Completion of the full curriculum has long been under contemplation and was recommended by the Royal Commission on Welsh University education, of which Lord Haldane was the chairman. This Commission held that the medical school should be an independent College in the University, but the claims of the University College of South Wales and Monmouthshire, which fostered the school through its initial stages, to remain suzerain, have prevailed. The school is to be governed by a Board of Medicine and a Faculty of Medicine, having the status of a Senate. Additional grants arising from a penny rate levied by the local authorities of Wales, and met by an equal sum from the Treasury, are providing the initial funds. The school is planned on the unit system; a professor in pathology and bacteriology, whose department in laboratory accommodation and in teaching strength must now be enlarged, has been in existence for some years. Now whole-time professors of medicine and surgery are to be appointed immediately, so that a full course can be embarked upon next October.

Clinical Work.

The clinical work is to be established at the King Edward VII. Hospital at Cardiff. At first the beds at the disposal of the clinical professors will be below the desired number; but when hospital finance is on a better footing the position will be remedied, while the possibility exists of obtaining immediate facilities at the Poor-law infirmary and at the Seamen's Hospital. The plan under consideration is not to extend the hospital on its present site, but to establish a large branch for convalescent and less important cases a few miles outside the city. Action on these lines would be at once less expensive than extension within the city, and would place the patients under more ideal climatic surroundings. At the same time an effort is to be made to concentrate at the central hospital all forms of out-patient clinical work—i.e., tuberculosis, venereal, infant welfare, and school work—in addition to psychiatry and ordinary out-patient work which already are carried on. Under the able direction of its new chairman, Sir William Diamond, extension and consolidation of the work of the hospital may be confidently anticipated.

The Cardiff district provides excellent material for the teaching of special subjects—at the City Sanatorium for infectious diseases, and at the Whitchurch Hospital for mental cases; while close association of the medical school with the King Edward VII. Welsh National Tuberculosis Association is assured through the newly-endowed David Davies Chair of Tuberculosis, the holder of which, Dr. S. Lyle Cummins, is also principal medical officer to the Association. The number of students is at present 250, spread over the first three years of study. Since, however, the figure contains certain ex-Service students, it is above the average to be expected in the future, but a steady entry year by year of between 50 and 60 students is anticipated. Much yet remains to be done to provide adequate facilities during the three clinical years for this number of students, and heavy responsibility must lie with the new Board of Medicine to obtain these facilities, and with the Faculty of Medicine to organise the teaching with the means at their disposal in accordance with modern thought. But the forging of a new school must of necessity be a difficult and toilsome procedure. To-day the metal of opinion in Wales is hot, and if constructive blows are shrewdly dealt, and if further benefactors to this national effort are forthcoming, a high grade medical school will be constructed of which the Principality may be justly proud.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

THURSDAY, MAY 26TH.

THE Council proceeded to the consideration of various reports.

Report of the Public Health Committee.

The report was presented by Sir JOHN MOORE (chairman of the Public Health Committee). The Committee has considered the returns (*a*) of professional examinations held in 1920 for Diplomas in Public Health, and (*b*) of exemptions granted by the licensing bodies from any of the rules of the Council in regard to such diplomas. The salient facts are summarised as follows: During 1920, 453 candidates were examined for the first examination, of whom 342, or 75·5 per cent., passed, and 111, or 24·5 per cent., were rejected. For the second and final examination 463 candidates presented themselves, of whom 373, or 80·6 per cent., were successful, and 90, or 19·4 per cent., failed. During the year the English Conjoint Board granted exemptions to 7 out of 142 candidates; the University of Liverpool granted exemptions to 8 out of 33 candidates; and the Victoria University of Manchester granted an exemption to 1 out of 43 candidates. Seventeen bodies granted no exemptions during the year in regard to qualifications in Public Health.

Since its last report the Committee has received reports, together with the remarks of the bodies concerned, from the Universities of London, Birmingham, Leeds, Sheffield, Edinburgh, and Glasgow. All the bodies whose examinations have been inspected have sent in their remarks, except the University of Durham and the Scottish Conjoint Board. The only bodies remaining to be inspected are the Universities of St. Andrews, Dublin, the Queen's University of Belfast, and the Irish Conjoint Board.

During the recess the chairman had dealt with a number of applications for special consideration, and the Committee at its meeting had considered and approved the action of the chairman in each case.

After presentation of the report Sir John Moore read the following recommendation of the Public Health Committee:—

> That in view of the fact that the Committee has reason to expect the completion of the inspection of Public Health Examinations in July, and with a view to preparing a detailed report on these inspections, and on the proposed revision of the resolutions and rules for diplomas in Public Health, the Committee recommend that the Council should sanction a special meeting of the Public Health Committee for these purposes to be held in the last week in September.

The report of the Public Health Committee, together with the above recommendation, were adopted by the Council.

Report of Students' Registration Committee.

The Council considered the report of the Students' Registration Committee, which included notice of the registration antedated according to precedent, of 101 medical students and 27 dental students, together with details and treatment of applications for registration and antedating in exceptional circumstances. The report also contained the Committee's resolution to the effect that application having been received for the approval of the Council of the Central Secondary School, Sheffield, and the Handsworth Technical School, Birmingham—both of which are recognised by the English Conjoint Board—these institutions be added to the list of those recognised by a licensing body and approved by the Council.

The report of the Student's Registration Committee was adopted by the Council.

Report of the Pharmacopœia Committee.

The Council considered the report of the Pharmacopœia Committee, which was presented by the PRESIDENT (chairman of the Committee).

The report stated that the number of copies of the British Pharmacopœia, 1914, which were sold by the publishers between Nov. 20th, 1920, and May 21st, 1921, was 980. The number sold in the year ending May 21st, 1921, was therefore 3106. The total number sold since the date of publication is 39,958. The stock in hand is sufficient to meet the present demand for some time to come.

Numerous communications have been made on behalf of the Committee to the Home Office concerning the draft regulations under the Dangerous Drugs Act. The Secretary of State, finding that many well-founded objections were taken to certain of the proposed regulations affecting the prescribing and dispensing of potent remedies, agreed to set up a special committee to consider these. Evidence was furnished by the Pharmacopœia Committee, and by other medical and pharmaceutical bodies, in favour of a modification of the regulations, in such wise that, while ensuring public safety, they should not unduly fetter the legitimate distribution and use of the remedies in question. The revised regulations have been published in the *London Gazette* of May 24th, 1921, and they appear to give effect to the representations made by the Committee in the public interest.

The report of the Ministry of Health Committee on the "biological" control of certain therapeutic substances, which cannot be sufficiently tested by direct chemical means, has now been presented to Parliament.

The recommendations of the Committee are in general accord with those submitted on behalf of the Council in 1909. They propose the establishment of a Privy Council Committee as controlling authority; the appointment of an Advisory Committee, on which the General Medical Council should be represented; the provision of a Central Laboratory under the Medical Research Council; and the institution of a system of licensing, inspection, and testing of samples, which would ensure to the public that the therapeutic serums and other preparations offered for sale were of the prescribed standard quality. These proposals require legislation before they can become operative. Should they pass into law, certain changes in and additions to the text of the Pharmacopœia will become necessary. There will be no difficulty in effecting such alterations, and the Committee will be ready at the proper time to make suitable submissions to the Council on the subject.

A short discussion of the report followed, during which Mr. E. B. TURNER (a member of the Council of the British Medical Association) stated that there had been many inquiries addressed to him by members of the medical profession as to whether the General Medical Council had approved the original regulations; it was necessary to remove misapprehension on this subject. A certain number of regulations had been approved, but the Committee had objected to others, and care was taken that the objections reached the right quarter.

The PRESIDENT said that the regulations which came to the Committee were draft regulations, and their observations had been sent before the draft was published. They were surprised to find that the draft regulations were published without amendment. Apparently the draft had been confused with the final form in which the regulations had appeared.

The report was adopted by the Council.

Report of the Dental Education and Examination Committee.

Sir JAMES HODSDON (chairman of the Committee) presented this report.

The report stated that the annual returns of professional examinations held in 1920 for qualification under the Dentists Act called for no comment. The Committee has had the dental curriculum under consideration from November, 1915, to November, 1917, and recommends that, in view of the proposed amendment of the Dentists Act, the question of requiring some preliminary instruction in biology for dental students and the consideration of the 1917 report on the dental curriculum be again postponed.

In November, 1920, the Council passed certain resolutions which are to come into operation on Jan. 1st, 1923, in regard to the registration of medical students. If any of these resolutions are to apply to dental students it is important, in the interests of those who propose entering

the dental profession, that the recommendations adopted by the Council in 1898 should be modified during the present session.

The existing recommendations for the preliminary examination and registration of dental students are :—

(1) "That every dental student shall, at the commencement of his studentship, be registered in the manner and under the conditions prescribed for medical students." (2) "That no person shall be registered as a dental student who has not previously passed one of the preliminary examinations in general education recognised by the Council."

In the report of the Departmental Committee on the Dentists Act (February, 1919, pp. 41, 153) the following recommendation is made: "We think that it is essential that a student, in ordinary circumstances, should have passed a preliminary examination in general education which should be the same for dental students as for medical students." Further, it is stated (152): "We notice that dental students may commence their course of professional study on reaching the age of 16. We are of opinion that a boy or girl who completes a course of study at a secondary school up to the age of 18 would probably be in a better position to profit from a course of professional study than one of the age of 16." The Departmental Committee's report (154) also states that—"It is desirable that the course of study in chemistry and physics should form a portion of the normal school course. A pass in science, with credit in chemistry and physics in the first schools examination, in secondary schools inspected by the Board of Education, should be accepted as entitling a student to enter his professional examination in these subjects, a pass in chemistry and physics in the second schools examination should be accepted as an adequate substitute for the professional examination in these subjects."

The recommendations of the Departmental Committee on the Dentists Act are thus similar to the "resolutions of the General Medical Council in regard to professional education" adopted by the Council in November, 1920.

The Dental Education and Examination Committee recommends that the preliminary examination and registration required of candidates for licences in dentistry or dental surgery be the same for dental students as for medical students, and that the recommendations adopted by the General Medical Council in May, 1898, be modified so as to provide :—

I. (*a*) That before registration in the Dental Students' Register every applicant shall be required to have passed, in addition to the examination in general education, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.

(*b*) That before registration as a dental student every candidate shall produce evidence that he has attained the age of 17 years. Provided: "That the minimum standard of general education required by the Council for registration as a dental student should be raised to a standard equivalent to that demanded in other learned professions previously to, or concurrently with, the coming into operation of the requirements of a preliminary examination in science before registration."

II. That the requirements contained in recommendation I. come into operation on Jan. 1st, 1923.

British Dental Association and a Diploma in Public Dentistry.

The Executive Committee, at its meeting in February, referred to the Committee, for its information, a memorandum in regard to this matter. The Committee recommends that no action be taken with regard to this matter at the present stage.

R.C.S. England—Regulations for the I.D.S.—A copy of the new regulations has been received. The grouping of the subjects of the examination has been altered; general and dental anatomy and physiology have been separated from the examinations in general and dental surgery and pathology of the general professional examination, and now form Part III. of the final professional examination or the licence. Candidates who have passed the preliminary science examination may enter for the examination in general and dental anatomy and physiology after completing six months' study at a recognised medical or dental school.

The report concluded with detailed accounts of applications for colonial and foreign registrations and recommendations of the Committee upon them.

The report was adopted by the Council.

Appointment of General Registrar.

The proposal to reappoint Mr. Norman C. King as General Registrar was unanimously carried by acclamation.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Scarcity of Nurses in Hospitals.

As a consequence of the social upheaval, occupations requiring a more than ordinary amount of devotion are not much sought after by the lower classes of the population. If it is hardly possible at present for a middle-class household to find a servant, this fact, not in itself important from the standpoint of the State, assumes a different aspect when it is considered that numerous women unused to household work now have to do it, and thereby suffer severely in health. Moreover, the children cannot be looked after so thoroughly if the middle-class mother has to leave them to do shopping, &c. The general health is thus materially affected. Still more important is the fact that the very onerous vocation of nursing is now becoming discredited. In the General Hospital alone, where good pay and good board are available, more than 70 sisters are wanted. In this country before the war nurses were mostly recruited from the same class as servant girls, barmaids, and factory hands. Better educated girls only took up this calling during the war. The latter now find it easier to work in shops or offices, whilst hospital nurses are eager to go out to the country hospitals, where they are much better off, with less work. Owing to the 8-hour day, instituted by law even in hospitals, the numbers required are trebled, and the scarcity results both from the removal of qualified women from the city and the absence of new-comers, necessitating the closing of several wards in the General Hospital.

Difficulties of Teaching Anatomy.

A serious condition has arisen in our anatomical institutes with regard to the problem of dissection. Hitherto all unclaimed bodies of persons dying in the hospitals were brought to the anatomical dissecting rooms for didactic purposes, together with many corpses of suicides and stillborn children. But with the break-up of the old empire the once large number of unclaimed bodies of patients from distant parts fell to nearly nil; furthermore, a private charitable religious society has been formed which claims nearly every dead body and gives it burial with religious rites within three days after death. The present first-year students have not much opportunity for dissection and have to be satisfied with study of skeletons and preserved specimens at the anatomical museum; and now and then one group of students can watch another group dissect a corpse. Naturally, the authorities of the medical faculty are endeavouring to improve the state of things. Legislative measures are suggested to enable adequate teaching of the principles of anatomy to be continued.

The "Allotment" Movement in Vienna.

Food scarcity during the war resulted in cultivation of vegetables on every available plot of waste ground, even within the city, where numerous public gardens and squares were also converted for the purpose. This national necessity has now been so impressed upon the town-dwellers that the precincts and outskirts of Vienna at present form a zone of highly-cultivated small gardens and allotments. The citizens are fully aware of the enormous advantages to be derived from this kind of work, not only from the economic point of view, but also from the physical, mental, and moral standpoints. Only by these means can the town-dweller rid himself of dependence upon the agricultural profiteer. Fully 25 per cent. of the supply of potatoes, 18 per cent. of cabbages, tomatoes, beans, and other fresh vegetables required by the population of Vienna have been derived last year from this source; and the slowly but steadily improving health of the bulk of the population is undoubtedly due to work in the fresh air and physical exertion.

Legal Permission for Interruption of Pregnancy.

The National Assembly will shortly be called upon to decide whether a law should be passed permitting the interruption of pregnancy whenever stringent medical or economic reasons demand it. The interruption should take place before the fœtus is three months' old, and nobody but a doctor of medicine should be permitted to perform the operation, of which a report must in each case be made to the Board of Health. Grave social and economic conditions, especially amongst families with numerous children, make this demand easy to understand; it clearly emanates from a real feeling of responsibility on the part of the politicians who have drawn up the report, amongst whom are nearly all the female members of the National Assembly.

X Ray Treatment of Cancer of the Uterus.

At a recent meeting of the Medical Society of Vienna Professor Weibel read an instructive paper on treatment of cancer of the uterus by X rays. The lecturer pointed out that it is only nine years since the first case of such a treatment was reported, and the initial enthusiasm with which the use of radium was received soon disappeared, while X rays continued to be used alone. In Erlangen and Berlin especially this method was much employed, and in high doses; it was believed that by applying a certain amount of the rays it was possible to kill or devitalise the cancer cells. But the after-results are not too encouraging. The method of the Berlin school makes it necessary to give the patient a transfusion of about 1000 cubic centimetres of blood immediately after the X ray sitting because of the rapid weakening of the patient. The donor, preferably one of the patient's relatives, must be waiting for the procedure at the doctor's office. The results of the extensive investigations of the Vienna school in this line go to show that it is possible, by combining X ray and radium treatment, applied after a radical operation, to cure cancer of the womb in about 50 per cent. of all observed cases. Only 20 per cent. of all cases can be regarded as fit for treatment without operation—i.e., by radiotherapy only; every case of cancer fit for operation should be operated on without losing time by previous radiotherapy; the latter follows the operation. Maximal doses should be used wherever possible. Professor Weibel prefers the vaginal route instead of the abdominal route, and its mortality statistics appear better. As regards the apparatus, it does not matter much which outfit is used, as long as the required intensity is obtained. In fact, many of the excellent results obtained within the last two years are due to old plants, much used during war time. In the discussion which followed Professor Weibel's paper the majority of those present seconded the views explained in the paper, but some expressed their belief that in the near future the curative effects of radium would be more thoroughly understood.

May 28th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Remuneration of Practitioners Treating Pensioners.

ACCORDING to a French Parliamentary Act of March, 1919, the remuneration of practitioners treating ex-Service men in receipt of disability pensions is a State obligation, when they are consulted for sequelæ due to war wounds, or for disease contracted in or aggravated by service. It has been mentioned in this correspondence that when the Bill was passed it was decided that remuneration was to be settled by arbitration. On March 9th, 1921, a decree was published by order of the Minister of Pensions in the *Journal Officiel* standardising professional fees. But a great majority of general practitioners thought the decree of the Ministry of Pensions was not in accordance with the conclusions arrived at by a special committee which had been selected to report on the matter. The Committee of the Union des Syndicats Médicaux de France have urged their members to oppose the decree ever since its publication. It was proposed to refer the decision to a committee consisting of delegates from the Ministry of Pensions, the Associations of Pensioners, and the Medical Syndicates. Since this suggestion was made the Minister of Pensions has invited members of all groups concerned to meet in conference. The Minister himself presided at the meeting. A compromise was reached, and it was decided that the decree will only be applied as far as previous medical attendances are concerned, while a new rate of remuneration will be adopted in the future to meet the practitioners' claims. It was also decided that there should be special rates of remuneration for surgical treatment and treatment given by specialists. These various rates of remuneration are to be settled by a committee consisting of delegates from the Ministry of Pensions, the Associations of Pensioners, the Union des Syndicats Médicaux de France, and this committee will also include medical practitioners who do not happen to be members of any syndicate.

Dangers of X Rays.

Since you have recently pointed out in your columns the scare promulgated by the Parisian popular press resulting from Mr. Contremoulin's report to the Academy of Sciences on experiments of his own, which indicate that it may be dangerous to live in the proximity of X ray centres, it may be of interest to your readers to know that at a recent meeting of the Académie des Sciences a special committee was appointed with the object of controlling Mr. Contremoulin's findings.

Radiology and the Medical Profession.

The Préfet de la Seine has recently selected a new chief of laboratory to be at the head of the X rays department of the Hospice de la Salpêtrière, where he is to occupy the post held previously by the late Mr. C. Infroit, whose death in the cause of science has been recorded in THE LANCET. This appointment has been officially accepted by Mr. P. Mourier, Directeur de l'Administration Générale de l'Assistance Publique. In consequence the Chairman of the Syndicat Général des Médecins Français Electrologistes et Radiologistes has addressed a letter to Mr. Mourier to let him know that the members of the Syndicate protest against his decision, on the ground that the newly appointed radiologist does not hold any medical qualification, and that such posts should be filled by medical men.

June 4th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Sir William Smyly and the Rotunda Hospital.

LAST week the Master of the Rotunda Hospital, Dr. G. FitzGibbon, and Dr. E. H. Tweedy, an ex-Master, presented to the hospital a portrait of Sir William Smyly, the senior surviving ex-Master. Sir William Smyly was Master from 1889 to 1896, and in making the presentation Dr. Tweedy referred to the great part which he had taken in modernising the work and equipment of the hospital, thus exercising an influence not only in Dublin, but throughout the kingdom. It was also largely due to Sir William Smyly's activity that the present gynæcological wing of the hospital was built, and it was during his mastership that efficient trained nursing was introduced.

Sir F. Conway Dwyer.

The name of Sir F. Conway Dwyer appears among the new knights in the list of birthday honours. Mr. Dwyer, who is one of the surgeons to the House of Industry Hospitals, was President of the Royal College of Surgeons in Ireland at the time of the outbreak of the war. For a considerable period he served as operating surgeon at King George V. Hospital with the rank of lieutenant-colonel. He is Inspector of Anatomy in Ireland.

An Honour for the Provost of Trinity College.

At their last meeting, the President and Fellows of the Royal College of Physicians elected as an Honorary Fellow the Right Honourable and Right Reverend J. H. Bernard, Provost of Trinity College.

Medical Representation in the Parliament of Northern Ireland.

The medical profession will be well represented in the Parliament of Northern Ireland. Of the four representatives of the Queen's University three are members of the medical profession—viz., Mr. John Campbell, Dr. R. J. Johnstone, and Dr. H. M. Morrison. Mr. Campbell is senior surgeon to the Samaritan Hospital, Belfast, and has long held a prominent position as a consulting and operating gynæcologist. He has been for some years Chairman of Convocation of the Queen's University Graduates' Association. He served in France as chief surgeon of No. 5 British Red Cross Hospital, and was adjutant and second in command of the Queen's University Veterans Volunteer Corps. Dr. Johnstone is professor [of gynæcology in the Queen's University of Belfast. He has been for twelve years a member of the Council of the British Medical Association, and has taken an active part in medical politics and administration. He is chairman of the Irish Medical Committee, and a former chairman of the Hospitals Committee of the British Medical Association. He is also a member of the Nursing Council for Ireland. He served during the war as one of the surgeons of the U.V.F. Hospital, Belfast. Dr. H. S. Morrison, who represents the country practitioners of the six counties, is coroner for the Coleraine District, and chairman of the South Londonderry Unionist Association and of the County Londonderry Branch of the Irish Union Alliance. The fourth member for the Queen's University, Mr. John H. Robb, a well-known member of the North-East Circuit, and the author of various legal text-books, has also close associations with the medical profession, to which his three brothers belong.

Ulster Medical Society.

At the annual meeting held in the Medical Institute, Belfast, on May 26th, the following officers were elected for the ensuing session:—President: Dr. Robert Hall. Vice-Presidents: Mr. James A. Craig, Belfast, and Dr. St. George, Lisburn. Council: Prof. C. G. Lowry, Mr. Howard Stevenson, Dr. W. Burns, Dr. V. G. L. Fielden, Dr. S. Boyd Campbell, Dr. M. Beath. Hon. Treasurer: Dr. S. I. Turkington. Hon. Secretary: Dr. W. W. D. Thomson. Hon. Librarian: Dr. W. L. Storey. Hon. Editorial Secretary: Dr. R. Marshall. A resolution of sympathy with Dr. W. W. D. Thomson in his prolonged illness was passed, and Dr. Marshall was thanked for his efficient discharge of his duties as secretary *pro tem.* A discussion took place on the finances of the society, and suggestions were made as to various means of meeting the annually recurring deficits in the budget.

SEAMEN'S NATIONAL INSURANCE SOCIETY.—The Society held its annual meeting in London on May 25th, Sir Norman Hill in the chair, when stock was taken of nine years' work. With the help of the medical profession a thoroughly efficient medical service has been established, available to every member in every port of the United Kingdom; £246,600 have been expended in benefits, institutional treatment has been provided for all cases of consumption for whom it had been recommended, and the finances of the Society are on a satisfactory basis. The great difficulty is the foreign-going sailor. His card has to be filled up by the officers of the ship, and enough care is not taken accurately to give his number and his name. Consequently he cannot always be identified and his money paid over to his society. The deficit at present is estimated at £50,000, lying idle in the hands of the Ministry of Health, and this sum should be available for increasing benefits and admitting these lost men to benefit. Sir Alfred Mond has promised that this matter shall be looked into. Everything should be done to help this Society, one-third of whose members, it is estimated, joined the fighting forces in the war.

Correspondence.

"Audi alteram partem."

THE PLACE OF PATHOLOGY IN MEDICINE.

To the Editor of THE LANCET.

SIR,—I have, as may be imagined, been somewhat astonished at the extensive publicity given to, and the amount of interest aroused by, a casual statement made in answer to a question put by a student after the last of a short course of lectures on general hygiene delivered to a number of very intelligent but not specially trained students. The question was: What did I think of cremation? My answer, that I look upon cremation as the most cleanly, sanitary, and convenient way of ensuring the rapid resolution of our no-longer-useful clay into its constituent elements. I pointed out, in passing, that certain objections are raised to this method of disposal of the dead, one of them being the cover it might afford to those who are too anxious to hurry their friends and others out of the world. If this but helped us to overcome the dislike that survivors have to allowing post-mortem examinations to be made on their dead, I for one should look upon it as something in its favour. I added that when my own time came to depart—naturally I was in no great hurry for this—I hoped a post-mortem examination would be made on my remains — and for the following reasons. One's illnesses and strains—some of them slight, some of them serious—had, I knew, left their mark on certain of my internal organs. I and my doctor friends who had been good enough to treat me, had noted certain symptoms and physical signs, on the importance of some of which we were agreed, concerning others differences of opinion arising. In view of all this I had arranged with an old friend who possessed a short record of certain portions of my clinical history, signs, and symptoms, that before my cremation these should be compared and co-related with the conditions found on post-mortem examination. Holding this as of some importance in my own case, I did not see why the same routine procedure should not be extended not only to doctors but to all intelligent people who have been trained to observe.

Whilst enjoying good health we need not trouble about these matters, but on the slightest departure from health we should make notes and call in the doctor to our aid. Just at present people—even intelligent people and officials—seem to think that the medical world is divided into water-tight compartments, in one of which are those who treat disease, in another those who investigate disease: in one those who maintain that disease and its history can only be studied at the bedside and by the clinician, in another those who garner their best harvest in the laboratory or "in a medical unit." Those who seek to divide the work of the "doctor" in this fashion are, I am satisfied, in very imperfect touch with the medical thought of the present day. There are those who are engaged on the study of the early phases of disease. They have been specially trained in this type of work, have had special opportunities of carrying it on, and the efforts of such men as Sir James Mackenzie and his disciples in this field have been fruitful beyond even their wildest hopes. On the other hand, we have amongst us men like Sir Clifford Allbutt, Henry Head, and F. W. Mott, to mention but a few outstanding names, who, in their clinical study, have called to their aid laboratory methods wherever they believe that they can derive help in the elucidation or explanation of the processes that play any part in the disturbance of functional processes or the production of organic lessons. They exploit the microscope, experimental physiology, bio-chemistry, and physics, and hand on the results of their researches to others.

During the war we have learnt much concerning the prevention of disease; we have made enormous advances in medical and surgical treatment, but best of all we have gathered into our profession a number of skilled surgeons, trained observers, and expert laboratory workers, who if they receive encouragement and support will be able to bring to bear on civil and State medicine some of the lore and experience gathered under conditions in which disease was the primary study, the individual patient receding into the background. In so far as we are able to bring the patient back to the position of foremost importance, and no further, shall we derive full benefit from all our experience gained on the field and in the war hospital.

At certain periods, owing to the development of some special phase or aspect of medicine, the other aspects are looked upon as being old-fashioned and "out of date," and one still hears of those who exhibit a contempt for research in the wards, for those who are incapable of realising the dignity of the work and opportunities of the general practitioner, of those who speak of careful work in the post-mortem room as "coffin-labelling," and of those again who are convinced that morbid histology has had its day. Many speak as though those working in these fields were seeking for the finished products of disease alone, and as though such workers had no thoughts of function and of the thousand minute changes that are associated not only with the changing structure but with impaired functions of organs and tissues. The so-called practical school has been unreasonably irked by what they consider the neglect of their work by the scientific or laboratory school, which latter again is often twitted for pinning its faith to the creed of the Red Lions, whose toast, "Here's to higher mathematics, may they be no use to anyone," achieved such vogue and fame.

In recent years the Edinburgh School of Medicine and its daughter in Manchester have, greatly to their credit, taken a forward step in teaching pathology which, to my mind, will, in the long run, have a greater bearing on the training of the medical practitioner than any step taken in recent years. All men cannot become skilled pathologists and bacteriologists, but all should be trained to interpret the signs and symptoms of disease and to allocate, more or less accurately, to each sign or group of signs some change of function, temporary or permanent, the results of pathological processes in their various stages and phases.

How can we study the beginnings of disease if we are constantly concentrating our attention and focusing our observations on the last illness of the patient? Last illnesses should no doubt be studied carefully, and all methods of investigation should be brought to bear on the complicated problems presented to us on these occasions, but every step that has led up to the final issue should, if possible, be submitted to examination. In the Edinburgh Medical School every student of pathology has placed before him the clinical notes of a case, containing a record of family and personal history, signs, and symptoms developed from time to time, the nature and results of treatment, and post-mortem findings. He has then to make a careful naked-eye and microscopic examination of the organs and tissues of the patient, and finally is called upon to write a report of the case as a whole, coördinating the findings at the various stages and explaining, as far as possible, the relation of the earlier changes to those of later date in the sequence of events.

If the medical student could, whilst writing these reports, have access to patients in the wards, suffering from diseases similar to those with which he is dealing, could examine and compare the history and clinical and laboratory findings, could note the effects of treatment, still clearer pictures of diseased conditions could be obtained. I hope this development may take place.

A few of the advantages of such an organised system are already apparent to those who have looked into the matter. How infinitely greater might these advantages become if all those who are interested in the study of disease—and this is an interest that should be shared by all educated and intelligent people—would make a point, when first they fell ill, of asking their medical men to help them to keep a record of their illnesses, would describe their sensations in their own words, and would get their doctors to interpret these sensations for them, and, finally, would give instructions that before burial or cremation their bodies should be carefully examined by someone skilled in the interpretation of lesions met with during the course of disease.

Under these conditions doctors would be called in earlier, prevention would play a far greater part in the maintenance of health, many illnesses would be nipped in the bud, the doctor would become his client's "adviser" and not merely his "repairer," the patient might confidently expect a longer, more healthy and efficient life, and medicine would become not a finer art merely but would attain a scientific level never hitherto attained.

I am, Sir, yours faithfully,

May 30th, 1921. G. SIMS WOODHEAD.

THE MEDICAL DIRECTORY, 1922.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to every member of the medical profession. We shall be grateful for its early return to us. If any practitioner fails to receive the form we will, upon request, send him a duplicate.

We are, Sirs, yours faithfully,

THE EDITORS.

7, Great Marlborough-street, London, W. 1,
June 4th, 1921.

WARMING ETHER VAPOUR FOR INHALATION.

To the Editor of THE LANCET.

SIR,—In his letter to THE LANCET of May 28th Dr. K. B. Pinson has criticised the method of heating in a tracheal insufflation anæsthesia apparatus described by me in THE LANCET of April 30th. May I point out that, in the apparatus referred to, the ether-laden air does not come into contact with the electric lamp as Dr. Pinson seems to suppose, and hence the danger of ignition of the ether must be extremely remote. Furthermore, for those who fear explosions, the construction, primarily intended for use when electricity is not available, admits of the use of hot water with equal efficacy.

As regards the practical value of heating anæsthetic vapours, I am convinced (and I believe that my conviction will be borne out by most anæsthetists) that in tracheal insufflation anæsthesia, at any rate, the adequate heating of the ether-laden air is a most important factor if pulmonary complications are to be avoided.—I am, Sir, yours faithfully,

I. W. MAGILL,
Anæsthetist, the Queen's Hospital for
May 30th, 1921. Facial and Jaw Injuries, Sidcup.

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES.

To the Editor of THE LANCET.

SIR,—It is unfortunate that in the necessarily abridged account of the speeches at the annual dinner of the Federation of Medical and Allied Societies, published in your columns last week, the invitation to the British Medical Association to officially participate in the work of the Federation, which such a large number of its members support through other societies, should have been omitted. Sir Malcolm Morris, Vice-President of the Federation and Chairman of its Medical Council, in proposing the toast of the Minister of Health, again offered the right hand of fellowship which has always been extended to the Association. He emphasised that

the British Medical Association was not asked to give up any of its activities nor was there any desire to interfere with its autonomy, and he made it clear, as also did Lieut.-Colonel F. E. Fremantle, M.P., in a later toast, that the work the Federation was doing was necessary and valuable work, and that it could not be done by the Association. The speakers in referring to the success of the Federation paid generous tribute to the past work of the British Medical Association, and in so doing indicated the greater possibilities which the future promised if these two organisations, the one primarily concerned with the interests of the patient and the other with those of the doctor, could go forward hand in hand.

The report of the dinner published in the *British Medical Journal* of June 4th duly recorded the invitation again extended to the Association, and I trust that you will be able to give space for this addendum to the account you have already published.

I am, Sir, yours faithfully,

N. HOWARD MUMMERY,
General Secretary.

The Federation of Medical and Allied Societies (Inc.),
5, Vere-street, Cavendish-square, W. 1,
June 5th, 1921.

*** We regret that in a report which had to be reasonably shortened the omissions to which Dr. Mummery refers should have occurred. We have pointed out many times the value of a rapprochement. —ED. L.

The Services.

ROYAL NAVAL DENTAL SERVICE.

Mr. Norman Godfrey Bennett, M.B. Camb., L.D.S., and Mr. Montague Hopson, L.D.S., have been appointed to act as examiners for the entrance examination.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lieuts. to be Surg. Lieut.-Comdrs.: J. Lorimer, L. C. D. Irvine, N. J. L. Rollason, B. Cohen, A. G. V. Elder, A. G. L. Reade, D. J. Williamson, W. C. Macartney, W. G. Evans, J. H. Lamb, and E. F. Murray.

ROYAL ARMY MEDICAL CORPS.

Capt. A. Rodd is placed on the h.p. list on account of ill-health.

Temp. Capt. G. J. McGorty to be Capt.

Temp. Capt. D. L. Lindsay relinquishes his commission and retains the rank of Capt.

The undermentioned to be temp. Lts.: D. Loughridge and W. B. Fox.

TERRITORIAL FORCE.

Capt. (actg. Maj.) G. Potts relinquishes the actg. rank of Maj. on ceasing to be specially empld.

Maj. H. A. Lake (late R.A.M.C.) to be Capt., and relinquishes the rank of Maj.

Capt. G. B. Fleming to be Maj.

Capt. J. Downie to be Maj.

J. Robinson to be Lt.

Lt. K. Pretty to be Capt.

ARMY DENTAL CORPS.

Capt. W. A. Rankin, late Dental Surg., Spec. List, to be Lt. (with the temp. rank of Capt).

The undermentioned Dental Surgs., from Spec. List, to be Lts. (with the temp. rank of Capt.): Temp. Capts. H. F. Byrne, H. O. Sumerling, C. T. Hastings, H. R. Ellis, and C. H. Pywell; Temp. Lt. J. J. Boyle.

SPECIAL RESERVE OF OFFICERS.

To be temp. Cols.: G. H. Edington, L. J. Blandford, and F. G. Proudfoot.

H. A. Leebody to be temp. Maj.

The undermentioned Capts. relinquish their commns.: O. Williams, and is granted the rank of Maj. And retain the rank of Capt.: J. A. Musgrave and D. B. Robertson.

DEFENCE FORCE.

To be Asst. Dirs. of Med. Servs.: Temp. Cols. A. D. Sharp, T.D., Def. Force; and F. H. Westmacott, T.D., Def. Force.

To be temp. Capts.: G. F. Hardy, T. B. Batchelor, W. J. Harrison, J. E. P. Coleman, and J. F. Weston.

1st (S. Midland) Fd. Amb F.D.—To be temp. Capt.: C. W. J. Brasher.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE DENTISTS BILL: THIRD READING.

THE Dentists Bill, a measure to give effect to the recommendations of the Departmental Committee on the Dentists Act, 1878, was considered by a Standing Committee of the House of Commons on Tuesday, June 7th. Mr. G. R. TURTON was in the chair.

Lt.-Colonel FREMANTLE moved an amendment to Clause 1 to place all existing unregistered dentists on a special list of registration. The British Dental Association, he said, were willing to admit unregistered dentists in partnership on condition that in future all men who practised should be under proper control. This position was taken up in the public interest. The Association objected to the proposal that men who had not gone through sufficient training in the theory as well as the practice of dentistry should be placed on a register on equal terms with themselves, so that the public would be led to suppose that there was little difference between the registered and the hitherto unregistered man. This matter had been considered by the Medical Committee of the House of Commons, and that Committee resolved to support the amendment that the unqualified dentist under registration should be placed on a separate list.

Mr. BRIANT said everyone must agree that the conditions of dentistry as they existed at the moment could not be allowed to continue. There should be some check on those men who put a board outside their house upon which they called themselves surgeon-dentists and professors. These advertisements unfortunately meant a great deal to some people.

Colonel WEDGWOOD said that the amendment supported the continuance of a corporation of vested interests in dentistry, similar to that of the British Medical Association in regard to medicine. It sought to give the dental practitioners an enormous advantage, raising their status and creating for them a monopoly. At the present time the majority of the working classes were attended by the unregistered dentists. The unregistered men were now being raised under the Bill to the status of the qualified practitioners. That would inevitably mean higher prices for dentistry, and although the unregistered dentist was to be registered the amendment would still draw a distinction between the qualified and the unqualified dental surgeon.

Mr. SEDDON said that there were approximately 10,000 men in this country engaged in the practice of dentistry, who had done so as unregistered practitioners for five years. He held that these men had gained the confidence of the public. They all wanted to raise the standard of dentistry, but he did not think the amendment would help to that end. He asked the British Dental Association to adopt the new system in a generous spirit.

Mr. HARTSHORN hoped the Committee would not accept the amendment, which aimed at making an inner and an outer circle, and the advantage would be for those who had the privilege of being in the inner circle. They would be known as the aristocracy of the profession.

Major MOLSON said to-day there were not sufficient dentists in the country. There were only about 4000 practising at the present time as registered dentists, and the Bill would cause the registration of about 9000 more. He had seen some of the work done by unqualified dentists, and he knew how great was the necessity for raising the standard. He thought it would be a good thing to have two stages—A and B—so that those in the lower category after the specified period could pass to the higher category

Sir A. MOND (the Minister of Health) said that as the amendment stood the unregistered dentist would not be placed on the register. He did not believe in dividing the profession into sheep and goats. If the amendment were accepted it would cut right across the whole foundation of the Bill and would wreck it.

Colonel FREMANTLE said that the British Dental Association did not wish to wreck the Bill, and he withdrew the amendment.

Mr. SEDDON moved an amendment to Clause 3 to include membership of the National Dental Association or the Chemists' Dental Society, as qualifications for admission to the Dental Register.—On a division the amendment was defeated by 26 votes to 6.

On Clause 4, which provides that all the directors, managers, and operating staffs of dental companies shall be registered dentists: Sir T. ROBINSON moved that only one of the directors need be registered.

Sir A. MOND said that one was too few. As a compromise he would agree to a provision that the majority of the directors should be registered dentists.

The amendment was withdrawn and the suggested compromise agreed to, reference to managers being omitted.

After further discussion the Committee stage of the Bill was completed, and the measure was ordered to be reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 1ST.

Post-war Disability Pensions.

Major Sir BERTRAM FALLE asked the Financial Secretary to the Admiralty when the post-war disability scale of pensions would be applied to the Royal Navy and Royal Marines.—Mr. AMERY replied: The post-war scales will become operative 30 days after the official termination of the war. It is anticipated that detailed particulars will be ready for publication at an early date. The regulations governing the application of the post-war scales to pre-war disability pensioners who have served in the present war are now practically complete, and as soon as some minor details have been settled the work of re-assessing these pre-war pensions will be taken in hand.

Pure Atmosphere and Public Health.

Mr. TREVELYAN THOMSON asked the Minister of Health whether his attention had been drawn to the appreciable improvement in the health of urban populations at the present time, attributable by many medical authorities to the purer condition of the atmosphere due to reduced coal consumption; and had he considered the possibility of securing these same health advantages by means of measures for smoke abatement when coal consumption again became normal.—Sir ALFRED MOND replied: The time during which the consumption of coal has been reduced has not been sufficient for the confirmation or contradiction of the suggestion in the first part of the question. The whole question of the pollution of the atmosphere by smoke and other noxious vapours is receiving the consideration of a Departmental Committee under the chairmanship of Lord Newton. I have no doubt that the Committee are fully conversant with the aspects of the problem to which the honourable Member refers.

National Health Insurance.

Mr. WILKIE asked the Minister of Health whether he had received representations from societies approved under the National Health Insurance Acts who had difficulties in meeting their administrative costs out of existing allowances; whether he was aware that the increased postal charges would add to these difficulties; and whether he could say when the measure for the relief of the societies by increasing the administration allowance would be brought before the House. 2. Sir THOMAS BRAMSDON asked the Prime Minister whether it was the intention of the Government to give immediate effect to the recommendations of the Departmental Committee on National Insurance Administration.—Sir ALFRED MOND replied: The answer to the first question is in the affirmative. The Departmental Committee appointed by my predecessor to go into the whole question took account of the effect of increased postal charges on the societies. I hope at an early date to introduce a Bill to give effect to the recommendations of the Committee which have been presented to Parliament.

Sir WALTER DE FRECE asked the Minister of Health whether his department had considered the likelihood that when the insurance year closes on July 3rd several million insured persons would be in arrear with their contributions owing to the amount of unemployment; whether such insured persons would, unless they paid 12*s.* before Oct. 31st to liquidate 25 contributions in arrear, be disqualified from receiving sickness, disablement, and maternity benefit for a whole 12 months; whether he could take any steps to ease what might become a very serious situation; and whether, in particular, he would consider the possibility of allowing Approved Societies to use some of their surplus funds, as ascertained by the recent valuation, to assist in paying off members' arrears. 2. Sir WALTER DE FRECE asked the Secretary to the Treasury whether the Government would, in view of the vast volume of unemployment, consider the possibility of extending the excusing of contributions under the National Health Insurance Act to persons while unemployed.—Sir A. MOND replied: The honourable Member has correctly stated the position of insured persons who will be in arrear with their contributions at the end of the insurance contribution year. The matter has engaged the close attention of the department and has already been discussed with a representative conference of Approved Societies. As a result it has been decided to ease the situation by allowing an insured person an extended period from July to the end of November in which he may make the comparatively small payment necessary to avoid or mitigate any reduction of benefit during the following calendar year. These payments are on a graduated scale varying from 1*s.* to 12*s.* in accordance with the extent of the arrears, and in the extreme case where the arrears exceed 26 a single payment of 5*s.* would qualify the insured person for sickness benefit at 8*s.* a week (in addition to any amount added by way of additional benefit) with full maternity benefit, and the rate of sickness benefit would be increased by 1*s.* a week for each further instalment of 1*s.* paid during the five months. There is nothing to prevent a society which has a disposable surplus in valuation submitting for the approval of the department a scheme for utilising the whole or part of the surplus for the remission of arrears.

Colonial Medical Service.

Lieutenant-Colonel FREMANTLE asked the Secretary for the Colonies whether he intended as recommended by the Colonial Medical Services Committee to appoint a Director-General of the Colonial Medical Service who would, inter alia, advise the Secretary of State and the permanent staff of the Colonial Office as to all questions relating to the personnel of the Colonial Medical Service.—Mr. WOOD replied: The recommendations of the Colonial Medical Services Committee are at present being considered in connexion with the observations of the Colonial Governments. I cannot yet make any statement as to the decision on the proposal to appoint a Director-General of the Colonial Medical Service.

Colonel FREMANTLE also asked the Secretary for the Colonies whether he had sanctioned a minimum salary of £600 per annum, with pension, for colonial medical officers as recommended in the Report of the Colonial Medical Services Committee.—Mr. WOOD replied: No, Sir, the differences in the resources of the several colonies are so great and the conditions under which their medical officers serve so diverse that I see no prospect of it being possible to insist on Colonial Governments adopting the minimum in question as a hard-and-fast rule. In a number of the more prosperous colonies the local governments have adopted, and in some cases exceeded, the minimum.

Colonel FREMANTLE: Is it conceivable that any decent respectable medical man can be obtained to go abroad for a less salary than that amount?—The SPEAKER: That does not arise out of the question.

THURSDAY, JUNE 2ND.

Secrecy in Medical Practice.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Health whether he was aware that the Insurance Committee of the area comprising Bramley, near Basingstoke, received an intimation that a portion of the Exchequer grant payable to them will be withheld in consequence of a local medical practitioner having declined to give information detrimental to one of his patients acquired by him in the course of his profession, such information having been called for at the behest of a rich corporation with whom the man was insured; and whether he would take action to secure that a doctor shall not be penalised for doing his duty to his patient.—Sir A. MOND replied: In the case to which this question appears to refer an Approved Society sought to obtain the opinion of the medical referee of the Ministry on the question of the incapacity for work of one of their members who was claiming sickness benefit, and I regret that the insurance practitioner has definitely declined to give any particulars as to the history and condition of the patient likely to assist the medical referee, notwithstanding the provision in his terms of service which clearly requires him to do this. In these circumstances it has become necessary to inform the doctor that a portion of the Exchequer grant forming part of his remuneration must be withheld, the grant being payable only if the terms of service were complied with. But in accordance with the provision of the Regulations any representations which the doctor may wish to make in the matter will first be considered.

Mothers' Pensions.

Mr. TYSON WILSON introduced a Bill to provide for pensions for mothers which was read a first time.

FRIDAY, JUNE 3RD.

Public Health (Officers) Bill.

The House considered the Public Health (Officers) (No. 2) Bill as amended in the Standing Committee.

On Clause 1, which deals with the tenure of office of a medical officer of health, Sir P. MAGNUS moved an amendment to insert at the beginning of the Clause the words "in cases to which this section applies."—The amendment was agreed to.

Sir P. MAGNUS moved to add at the end of the Clause the words: This section applies to—(*a*) the medical officer of health of a county borough where any portion of the salary of the medical officer was paid out of moneys voted by Parliament before it was constituted a county borough; (*b*) the medical officer of health of a county district any portion of whose salary is paid out of the county fund of the county in which the district is situate and charged to the exchequer contribution account.

Dr. MURRAY asked for an explanation of this amendment.—Sir P. MAGNUS said that this amendment was put

in at the request of the Ministry of Health in order to restrict the operation of the Bill to certain local authorities which had special advantage given to them previously.—On a division the amendment was carried by 100 votes to 17.

The Bill was read a third time and passed.

Dogs Protection Bill.

Sir F. BANBURY, in moving the second reading of the Dogs Protection Bill, said the Bill had already passed second reading on three different occasions, twice without a division, and once by a considerable majority. If any honourable Member was under the impression that by passing it he would injure the cause of vivisection he would read an extract from THE LANCET, dated May 31st, 1919: "This is not to say that such knowledge could not have been acquired in any other way." Therefore having the admission of THE LANCET,[1] the well-known and recognised authority of the medical profession, it was evident that the knowledge which the medical profession said was acquired by experiments on dogs could be acquired in another way. The right hon. baronet concluded by reading a passage in praise of the dog written by an American poet and writer, whose name, he said, he regretted he did not know.

Sir WATSON CHEYNE said this was the third or fourth time that he had had to speak on this Bill, and naturally it was rather difficult to say anything new. He would summarise the chief objections which they as a scientific and medical profession had against the measure. He was a dog-lover—all his friends were dog-lovers—and they sympathised with the passage read by Sir F. Banbury. It was not that they disliked dogs, but that they could not afford to lose the experience that could be gained from them. The first thing that they asserted, in contradiction to THE LANCET, was that there were many fields of knowledge that they must explore if they were to advance the science of medicine and do their duty in the fight against disease. Some of the fields of observation which they gathered from the dog were quite necessary. It was not simply a question of vivisection. The animals that were used in experiments fell into four classes: these were the small rodents, rats, mice, and guinea-pigs; dogs; cats to a smaller extent; horses, rabbits, and apes. Other animals were only occasionally used. Rodents were almost entirely used in connexion with investigations respecting infectious diseases. Horses were used not so much for experiments as for commercial purposes and for the production of sera, such as tetanus antitoxin, which saved so many lives during the war. The animal had to be infected with the disease. The dog and the ape were really the only two animals from which they got the main part of their knowledge as regarded the processes of health and disease. It was quite true that most of the work could be done with apes, not so conveniently in some cases, certainly not so cheaply. But one or other must be used for various reasons. In the first place, if they wanted to get results which they could apply in the treatment of disease they must have animals whose mode of life resembled man's and whose metabolism and chemical changes in their bodies were on the same lines as man's. He knew that Sir F. Banbury was not out for humanitarian purposes. It did not matter to him what animals were vivisected so long as they were not dogs, and therefore he said why not use apes? There were various objections. In the first place there were not many apes in this country, and in the second place the apes were not so easily handled. They were not so tame as dogs; they were more like spoiled children. Put a dressing on a dog and he did not trouble so much about it. In a few hours he apparently forgot about it; but the ape did not forget. He never rested satisfied until he had torn open the stitches and vitiated the whole experiment. It would be extremely difficult to carry out many delicate operations which did not hurt the animals in the least. They must take account of the question of expense. The men who were engaged in this sort of work were in the great majority of cases poor men. They did not spend their money on pleasure, but on instruments and other things they wanted for their experiments; and to ask the poor man to buy such expensive animals as apes was out of the question. He would be very much surprised if the House would pass any vote for a laboratory if they found that apes were being used instead of dogs. There would be an economical outcry against it. The results which had been got from experiments on dogs were of the greatest value and were the groundwork of our whole knowledge of the healthy processes of human nature. Physiology, the science of health, was based almost entirely on observations on dogs. It was said by opponents that they would not so much object if the experiments led to a practical result. But it did not do to despise knowledge because it had no immediate utilitarian outlook. Almost all the great sciences had begun in insignificant things.—The honourable Member was still speaking at five o'clock when by the rules of the House the debate stood adjourned.

[1] See page 1255 for comment upon this sort of quotation. The reference was to a particular series of results.

HOSPITAL FINANCE:
REPORT OF THE VOLUNTARY HOSPITALS COMMITTEE.

THE final report of the small committee over which Viscount Cave presides contains the following important recommendations:—

(1), (2) That a Hospitals Commission and Voluntary Hospitals Committees be formed for the country as a whole, the King Edward's Hospital Fund for London continuing to perform the functions of the latter for the Metropolitan Police District.

(3), (4) That Poor-law guardians be authorised to enter into arrangements as to the use of infirmaries, and that county councils be empowered to contribute to the expenses of voluntary hospitals committees.

(5) That failing the provision in the National Health Insurance Acts of a "hospital benefit," the courts be authorised to award to hospitals compensation under the Employers' Liability and Workmen's Compensation Acts.

(6) That local authorities be authorised to pay the cost of the treatment in hospitals of persons in their employ.

(7) That the payment out of technical education funds of grants for the training of nurses be considered.

(8) That provision be made for obtaining and tabulating returns of cases treated in hospitals.

(9), (10), (11) That all contributions by employers to hospital funds be allowed as deductions from profits for income-tax purposes, that where the payment to a hospital of a testamentary gift of residue is delayed for more than a year, the hospital be authorised to claim repayment of income-tax, and that legacy and succession duty on testamentary gifts to hospitals be remitted.

(12) That Parliament be asked to sanction a temporary grant of £1,000,000 to be expended under the direction of the Hospitals Commission in the assistance of hospitals which require it.

A last clause states that the Hospitals Commission should be authorised during a period of two years to recommend grants for the extension and improvement of hospitals subject to like contributions being made from private sources.

These recommendations if adopted will require legislation or executive action.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At the Congregation held on Saturday, June 4th, the following degrees were conferred:—

M.D.—C. S. Clarke and L. M. Weeks, Caius.

Ph.D.—C. G. L. Wolf, Christ's.

M.B., B.Ch.—H. Barbash, St. John's; and L. W. Batten, Sidney.

B.Ch.—W. H. Marshall, Pembroke.

Diploma in Psychological Medicine.—The dates for the next examinations have been fixed as follows: for Part I. (Anatomy and Physiology of the Nervous System and Psychology) Oct. 11th, 12th, and 13th, 1921; for Part II. (Neurology and Psychiatry) Nov. 30th, Dec. 1st, and 2nd, 1921. A course of instruction for the Diploma will be held in Cambridge from July 18th to August 20th. Lectures and practical work will be given by Dr. J. P. Lawson (Psychology), Dr. C. R. A. Thacher (Anatomy and Physiology of the Nervous System), Dr. J. F. E. Prideaux and Dr. C. S. Myers (Psychopathology), Dr. W. H. R. Rivers (Psychology and Pathology of Dreams), Dr. M. A. Archdale (Mental Diseases). Those who wish to take the course are requested to send their names, if possible, before July 10th, to the Secretary of the D.P.M. Committee, Psychological Laboratory, Cambridge, from whom further particulars may be obtained.

UNIVERSITY OF MANCHESTER.—Mr. Harold Robinson, D.Sc., Senior Lecturer in Physics and Assistant Director of the Physical Laboratories, has resigned his appointment. The Turner Medical Prize has been divided between Mr. G. V. Ashcroft and Miss Margaret Single.

THE PRINCE OF WALES AND THE RED CROSS.—The message sent by the Prince of Wales to the League of Red Cross Societies in connexion with a world-wide campaign to increase the membership of the Red Cross in all countries reads as follows: "I am very glad to learn from you that the Red Cross Societies of the world, under the auspices of the League of Red Cross Societies, are undertaking a campaign for membership to enable them to carry on the peace work of the Red Cross. The

effort which the League of Red Cross Societies is making to serve humanity in peace time as well as in war, has my heartiest approval, and I trust that your campaign will result in a very large addition to the membership of National Red Cross Societies." Other messages of warm approval have been received from Lord Robert Cecil, from the President of the Republic of Czecho-Slovakia, from Mr. Samuel Gompers, Cardinal Mercier, and Mr. Herbert Hoover. The aim of the British Red Cross Society is to enlist the service of the whole country in the work of healing. It is hoped that volunteers will offer their services to the British Red Cross Society to help the suffering in peace time in the same spontaneous manner in which they came to the aid of the sick and wounded in war time. The peace activities of the British Red Cross Society include the after-care of the disabled ex-Service man, aid to the hospitals, work at infant welfare centres and day nurseries, and assistance to the clergy and educational authorities. The Red Cross, members are reminded, should be available on all occasions when the clergy and heads of educational establishments, such as orphanages, require the simple assistance which is often lacking on such occasions as school and choir treats and annual outings. The glamour and the brassards may have disappeared, together with the ornamental people to whom the Cross of Geneva was an excuse to smile for press photographers; the hard work still remains on lines perhaps less interesting and certainly more obscure.

FEDERATION OF MEDICAL AND ALLIED SCIENCES.—A meeting of the Medical Council of the Federation was held at 11, Chandos-street, W., on May 31st, when consideration was given to the possible means of providing additional medical services to supplement the existing resources of practitioners and bring within reach of all sections of the community modern methods of treatment now largely confined to the well-to-do. The Organising Committee of the National Provident Scheme for Hospital and Additional Medical Services had submitted to the Federation its proposals and these were fully discussed and explained by Dr. Gordon Dill. It was resolved to obtain the opinions of the constituent Societies with a view to again pressing for a public and independent inquiry into the working of the medical benefit clauses of the National Insurance Act. The intention was stated to make the inquiry in a constructive spirit and with a genuine desire to retain all that is good and add what may be lacking.

It was decided that the annual meeting should be held on June 28th next. A number of medical men were elected individual members of the Federation.

ROYAL SANITARY INSTITUTE.—Preliminary arrangements for the Congress to be held at Folkestone, from June 20th to 25th, have now been issued. The President will be Lord Radnor, and the hon. local secretaries are Mr. A. F. Kidson, town clerk, and Dr. M. G. Yunge-Bateman, medical officer of health. The sections will be as follows:—(*a*) Sanitary Science and Preventive Medicine; President: Sir Leslie Mackenzie, M.D.; Recording Secretary: Dr. W. J. Howarth. (*b*) Engineering and Architecture; President: Major W. H. Prescott, M.P.; Recording Secretary: Mr. W. C. Tyndale. (*c*) Hygiene of Maternity and Child Welfare, including School Hygiene; President: Mrs. H. A. L. Fisher; Recording Secretary: Dr. Charles Porter. (*d*) Personal and Domestic Hygiene; President: The Mayoress of Folkestone (Mrs. Reginald G. Wood); Secretaries: Mrs. J. E. G. Calverley, Mrs. Sydney Weston. (*e*) Industrial Hygiene; President: Lord Burnham; Recording Secretary: Dr. E. H. Snell. Fellows, members, and associates of the Institute are supplied with tickets for the Congress on application to the Secretary before the Congress, or tickets can be obtained at the Reception Room during the meeting. To those not connected with the Institute, Congress tickets, at £1 11*s.* 6*d.* each, can be obtained from the hon. secretaries, Royal Sanitary Institute Congress, Town Clerk's Office, Folkestone. Ladies' tickets (not including copies of the proceedings), 10*s.* 6*d.* each.

LIVINGSTONE COLLEGE.—Commemoration Day, May 27th, was celebrated at Livingstone College, Leyton, Sir George Makins presiding. Dr. L. E. Wigram, the retiring Principal, said that though his health prevented him from continuing as Principal of the College his work in connexion with it as a lecturer would not cease. Referring to new developments at the institution, he said women students would be admitted and next session arrangements would be made for them as residents. Sir George Makins said the aim of the missionary was to minister to the souls and bodies of his fellow men. To fulfil this dual object it was necessary that he should have, in addition to his theological training, some knowledge of medical things. Sir George Makins emphasised the great value of partial medical training in everyday life, instancing the great help it had been in the work of orderlies and V.A.D.'s during the recent war, and its uses in the Mercantile Marine. If the benefit of partial medical training was so felt in a civilised country, he said, how much more necessary must it be in the mission field where a man was far from qualified medical aid. Such knowledge as could be obtained at Livingstone College must be immensely helpful. Dr. C. F. Harford, representing the Committee, in proposing a vote of thanks to Sir George Makins, expressed the regret of the Committee at Dr. Wigram's enforced resignation, and wished him many years connexion with the College as lecturer. He welcomed in the name of the Committee Dr. T. Jays as the new Principal, and felt sure that he was the right man to fill the post.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The distribution of prizes by the Duke of Connaught will take place on Tuesday, June 21st, at 3 P.M.

ROYAL INSTITUTION OF GREAT BRITAIN.—An extra Friday evening discourse will be held on June 17th, at 9 o'clock, when Sir J. J. Thomson, F.R.S., will lecture on "Chemical Combination and the Structure of the Molecule."

RONTGEN SOCIETY.—At the meeting of the Society to be held at 35, Russell-square, London, W.C., on June 16th, at 8.15 P.M., there will be a discussion on the Physics of the X Ray Tube. All interested are invited to attend.

A Dining Club composed of all past and present members of the honorary and house staffs of the Hospital for Sick Children, Great Ormond-street, held its first dinner on June 1st. Sixty-three members attended, including many who were house officers of the hospital as far back as 1880–1890, when Sir Thomas Barlow presided.

A TRIBUTE TO THE MEMORY OF SIR MORELL MACKENZIE.—On Sunday, June 5th, a group of well-known laryngologists assembled at Wargrave to pay a tribute to the memory of Sir Morell Mackenzie, who had a residence in the little Berkshire village, and is buried in the churchyard of St. Mary's, Wargrave. A special service was held in the churchyard by the Rev. S. M. Winter, after which Mr. Mark Hovell and Dr. James Donelan, former assistants to Sir Morell Mackenzie, placed a laurel wreath upon the tomb. Mr. Hovell, Sir StClair Thomson, and Sir James Dundas-Grant, gave short addresses. Dr. Irwin Moore, who had recently acquired Sir Morell Mackenzie's house at Wargrave, acted as host to a gathering which he had been instrumental in assembling.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART. A Systematic Post-Graduate Course of Instruction in Diseases of the Heart will be held at this hospital from July 11th to 23rd. Practical instruction will be given in the use of the polygraph, electrocardiograph, and other instruments. Systematic and clinical instruction will be given in the wards and the out-patient department throughout each day. The number admissible is limited. Applications should be made as soon as possible to the Secretary, National Hospital for Diseases of the Heart, Westmoreland-street, London, W.1.

LADIES' MEDICAL GOLFING SOCIETY.—A meeting will be held at Beaconsfield Golf Club on Wednesday, June 15th. The annual subscription to this society is 5*s.*, and those eligible for election include medical women and the wives, sisters, and mothers of medical men. Further particulars can be obtained from the hon. secretary, Mrs. Laming Evans, 50, Seymour-street, London, W.1.

MEDICAL GOLFING SOCIETY.—The 1921 tournament will be held on Thursday, June 16th, at Walton Heath Green fee of 2*s.* 6*d.* for the day. Trains leave Charing Cross and London Bridge for Tadworth. Thence by conveyance to the course. A Challenge Cup for the Medical Golf Championship has been presented by the THE LANCET. This championship is played annually at the meeting of the Medical Golfing Society, and the Cup is held for the year by the player on the Medical Register who makes the best scratch return v. Bogey. A replica of the Cup is also given as a memento. The "Henry Morris" Challenge Cup and the Medical Golfing Society's Gold Medal will be awarded for the best return under handicap. First, second, and a prize for the best last nine holes will be given in each class. No player can take the first or second, and the prize for the best nine holes. Class I. Handicaps 8 and under. Class II. Handicaps over 8. Handicap limit 18. (Members of the Walton Heath Golf Club will deduct two from their handicaps.) Cards may be handed in till 7.30 P.M. A Foursome Sweepstake will be arranged in the afternoon. Players who want caddies (fee 5*s.*) must make their own arrangements with the Caddy Master at Walton Heath. Anyone on the Medical or Dental Register is eligible to join this society by payment of the annual subscription of 5*s.* Entries should be sent on or before Tuesday, June 14th, to Dr. L. E. Creasy, hon. secretary and treasurer, The Medical Golfing Society, 36, Weymouth-street, London, W.1.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Thursday, June 16th.

GENERAL MEETING OF FELLOWS: at 8.30 P.M.
Discussion: on "The Problem of the Private Clinic System in Great Britain." To be opened by Sir Thomas Horder. The following will also speak:—Dr. G. C. Anderson, Mr. W. Clayton-Greene, Mr. W. S. Dickie, Mr. Bishop Harman, Dr. A. F. Hurst, Dr. Drury Pennington, Sir Humphry Rolleston, Dr. Gilbert Scott, Dr. Maurice Wright.
Fellows desiring to take part in the discussion are invited to send in their names to the Hon. Secretaries.

Tuesday, June 21st.

GENERAL MEETING OF FELLOWS: at 5 P.M. Ballot for election to the Fellowship.

MEETINGS OF SECTIONS.

Thursday, June 16th.

SECTION OF DERMATOLOGY: at 5 P.M.. (Cases at 4.30 P.M.
Cases will be shown.

Friday and Saturday, June 24th and 25th.

SECTION OF STUDY OF DISEASE IN CHILDREN.
Provincial Meeting at *Reading.*

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY, June 17th.—7.45 P.M., Demonstration. 8.15 P.M., Annual General Meeting. Paper:—Major R. Knowles: The Mechanism and Treatment of Snake Bite in India.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.
TUESDAY, June 14th, and THURSDAY.—5 P.M., Croonian Lectures:—Dr. F. L. Golla: The Objective Study of Neurosis.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, June 13th.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. Dr. Simson: Diseases of Women. Dr. Morton: X Ray Department. 4.15 P.M., Lecture:—Dr. Arthur Saunders: Gastric Disorders in Old Age.
TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations and Visit to Wards. 2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose and Ear. Dr. Pernet: Skin Department. Dr. Burnford: Medical Out-patients. 5 P.M., Lecture:—Dr. Pritchard: Chronic Infective Processes.
WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 12 noon. Mr. Sinclair: Surgical Diseases of the Abdomen 2 P.M., Mr. Gibb: Eye Department. Mr. Donald Armour: Demonstration of Cases, Surgical Wards.
THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. Bishop Harman: Eye Department. Mr. Baldwin: Orthopædic Department. 5 P.M., Special Lecture:—Dr. Harry Campbell: Observations on Diet. (Open to all Medical Practitioners.)
FRIDAY.—10 A.M., Dr. Grainger Stewart: Neurological Demonstration. 2 P.M., Mr. Tyrrell Gray: Surgical Out-patients. 2.30 P.M., Mr. Addison: Visit to Surgical Wards. 5 P.M., Lecture:—Mr. Baldwin: Surgery of the Rectum (1).
SATURDAY.—10 A.M., Dr. Arthur Saunders: Medical Diseases of Children. 2 P.M., Mr. Sinclair: Surgical Out-patients. Dr. Oxen: Medical Out-patients.
Daily:—10 A.M., Visit of Post-graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, June 13th.—10 A.M., Mr. W. E. Tanner: Surgical Out-patients. 2 P.M., Dr. A. J. Whiting: Medical In-patients. 2.30 P.M., Mr. J. B. Banister: Gynæcological.
TUESDAY.—9.45 A.M., Lt.-Col. R. H. Elliot: Eye Operations and Cases. 2.30 P.M., Dr. J. Metcalfe: X Ray Department. 3 P.M., Lecture:—Mr. C. H. Hayton: Anatomy of the Nose and Accessory Sinuses.
WEDNESDAY.—2 P.M., Mr. C. H. Hayton: Throat Operations. 2.30 P.M., Dr. W. J. Oliver: Dermatological. 3 P.M., Lecture Demonstration:—Mr. W. E. Tanner: Clinical Pathology and Differential Diagnosis of Scrotal Enlargements.
THURSDAY.—2 P.M., Mr. N. Fleming: Eye Department. 2.30 P.M., Mr. J. B. Banister: Gynæcological Operations. Dr. J. Metcalfe: Radiology.
FRIDAY.—2 P.M., Dr. C. E. Sundell: Diseases of Children. 3 P.M., Lecture Demonstration:—Mr. T. H. C. Benians: Blood Examination in Diagnosis. 5 P.M., Dr. Provis and Mr. Benians, Venereal Department.
SATURDAY.—10.30 A.M., Mr. W. E. Tanner: Operations. 3 P.M., Mr. H. W. Carson: Surgical In-patients.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen Square, W.C. 1.

MEDICAL SCHOOL.

MONDAY, June 13th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Aldren Turner (Lecture Room): Demonstration of Cases.
TUESDAY, June 14th.—2 P.M., Dr. Grainger Stewart: Out-patient Clinic. 3.30 P.M., Lecture:—Mr. Armour: Surgical Treatment of Spinal Cord Tumours (2).
THURSDAY, June 16th.—2 P.M., Dr. Farquhar Buzzard: Out-patient Clinic. 3.30 P.M., Lecture:—Dr. Farquhar Buzzard: Encephalitis Lethargica.
FRIDAY, June 17th.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Dr. Collier (Lecture Room).

NEUROLOGICAL OPHTHALMOLOGY.

WEDNESDAY, June 15th.—3.30 P.M., Mr. Leslie Paton Papilloedema.
Fee for Post-Graduate Course £7 7s.
C. M. HINDS HOWELL, Dean.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Turner-street, Mile End, E.
Courses of Lectures:—
A Course of Fourteen Lectures on Psycho-Neuroses, to be given by Dr. M. Culpin in the Clinical Theatre of the Hospital. Open to Students of the Hospital and to Members of the Profession.
TUESDAY, June 14th.—5.15 p.m., Lecture XII: Treatment.
FRIDAY.—5.15 P.M., Lecture XIII: Association Methods.

Advanced Lectures in Physiology, to Students of the University and to others interested in the subject.
A Course of Eight Lectures on Reception of Sensory Stimuli, to be given by Prof. H. E. Roaf in the Physiology Theatre.
THURSDAY, June 16th.—4.30 P.M., Lecture VI.

SURGICAL UNIT.—A Special Course of Ten Lectures on Advanced Surgery in the Unit Theatre to Post-graduates and Senior Students.
TUESDAY, June 14th.—4.15 P.M., Mr. R. Warren: Ventral Hernia.
WEDNESDAY.—4.15 P.M., Mr. R. Warren: Suppuration of the Lung.

UNIVERSITY OF LONDON.
Advanced Lectures to Students of the University and to others interested in the subjects.
A Course of Four Lectures in Pharmacology, on Some Actions of Foodstuffs in the Production and Treatment of Disease, to be given by Prof. E. Mellanby at the Royal College of Surgeons, Lincoln's Inn-Fields, W.C.
MONDAY, June 13th, and TUESDAY.—5 P.M., Lectures III. and IV.

ST. BARTHOLOMEW'S HOSPITAL (UNIVERSITY OF LONDON), West Smithfield, E.C.
A Course of Eight Advanced Lectures in Physiology, to be given in the Physiological Laboratory, to Students of the University and others interested in the subject.
TUESDAY, June 14th.—4.30 P.M., Lecture VII.:—Dr. H. H. Dale: Anaphylaxis.

A Course of Four Advanced Lectures in Medicine, to be given in the Surgical Lecture Theatre, to Students of the University and others interested in the subject.
MONDAY, June 13th, WEDNESDAY and FRIDAY.—5 P.M., Prof. F. R. Fraser: The Therapeutic Use of Digitalis (Lectures I., II., and III.).

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, June 16th.—4 P.M., Lecture:—Dr. Thursfield: Mongols.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E.
A Course of Post-graduate Clinical Lectures and Demonstrations in the Board Room of the Hospital, free to Medical Practitioners and Students of Medicine.
MONDAY, June 13th.—4 P.M., Mr. W. P. T. Atkinson: Tinea Tonsurans and its Treatment by X Rays.
TUESDAY.—4 P.M., Dr. S. A. Owen: The Premature Baby.
THURSDAY.—12 noon, Mr. V. Nesfield: The Treatment of Corneal Ulcers by Subconjunctival Injection of Phenolaine Solution.
FRIDAY.—3.30 P.M., Dr. J. L. Bunch: Skin Diseases in Children.

TAVISTOCK CLINIC FOR FUNCTIONAL NERVE CASES, 51, Tavistock-square, W.C.
A Course of Ten Lectures on Elementary Psychotherapy, to be given by Dr. H. C. Miller, at the Kingsway Hall, Kingsway, W.C.
FRIDAY, June 17th.—5.15 P.M., Lecture VII., Analytical Methods; Reassociation and Readjustment; Word Association; Hypnoidal Analysis.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, in the Lecture-room of the Bacteriological Department.
A Course of Lectures on Pathological Research in its Relation to Medicine, open to all Members of the Profession and Students.
THURSDAY, June 16th.—4.30 P.M., Prof. W. Bulloch: Use and Abuse of Scientific Medical Literature.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, June 14th.—4.30 P.M., Lecture:—Dr. E. B. Leech: Blood Pressure.

Appointments.

ARMSTRONG-JONES, Sir R., M.D. Lond., has been appointed a Visitor in Lunacy.

BROWN, A. MIDDLETON, M.D. Aberd., D.P.H., Medical Officer of Health and Schools Medical Officer for the City of Hereford.

MCPHERSON, J. M., M.B., Ch.B. Glasg., Medical Officer of Health to the Swansea Rural District Council.

WARBURTON, G. B., Ch.M., F.R.C.S., Visiting Surgeon to the Crumpsall Institution and Infirmary, Manchester.

WEBSTER, J. H. DOUGLAS, M.D. Edin., M.R.C.P. Edin., Honorary Physician-in-Charge of Department of Physical Medicine at the Middlesex Hospital.

YOUNG, W. A., B.Sc., M.B., B.S., M.R.C.S., L.R.C.P., Pathologist to St. John's Hospital for Diseases of the Skin.

Jessop Hospital for Women, Sheffield: HALL, R. J. B., M.B., Ch. B. Otago, Senior Resident Officer, and JAEDE, C. H., M.B., Ch.M. Sydney, and SOPHIANOPOULOS, G. J., M.R.C.P. Lond., M.R.C.S., Assistant House Surgeons.

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Births, Marriages, and Deaths.

BIRTHS.

BIGLAND.—On May 29th, at Rodney-street, Liverpool, the wife of Dr. Douglas Bigland, of a daughter.

FALCONER.—On June 2nd, the wife of Dallas S. Falconer, M.B., Ch.B., F.R.C.S., of a son.

SWAN.—On June 2nd, at Dartmouth House, West Byfleet, Surrey, the wife of James Swan, M.C., M.B., Ch.B., F.R.C.S., of a daughter.

MARRIAGES.

GREAVES—DUGGAN.—On June 2nd, at St. Luke's, Grayshott, Dr. S. Sowry Greaves, D.S.O., M.C., to Eva Duggan, M.B.E.

SHEPHERD—GORDON.—On June 2nd, at St. John's Wood Presbyterian Church, London, George A. Shepherd, M.B., Ch.B., Mornington House, Old Southgate, London, to Coral Ogilvie Gordon, M.B., Ch.B.

DEATHS.

FORTESCUE-BRICKDALE.—On June 2nd, at Clifton, John Matthew Fortescue-Brickdale, M.D. Oxon., M.R.C.P. Lond., aged 51.

JUPP.—On June 6th, at Chalfont Park Hotel, Gerrards Cross, of pneumonia, Ralph Tennyson Jupp, M.B., F.R.C.S., aged 45 years.

LITTLE.—On May 30th, at Midgham, Berks, Capt. Gerald Lewis Little, M.B., F.R.C.S., I.M.S., retired, aged 37.

MORTON.—On May 28th, at Territet, Switzerland, Charles James Morton, M.D. Edin., late of Walthamstow and Welbeck-street.

SKYRME.—On May 28th, Christopher Ralph Skyrme, M.B., B.C., B.A., of Albany-road, Bexhill-on-Sea, in his 49th year.

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ALPINISM.*

BY JOSEPH BARCROFT, C.B.E., M.A., F.R.S.

THE effects of rare air upon the human body have always had a peculiar fascination for those who make physiological inquiry their life's work. In spite of all the thought that has been spent on it in the last fifty years, the subject is as full of interest as ever. For this there are several reasons. On the intellectual side it is evident that the knowledge already gleaned has merely served to arouse a deeper interest; on the practical side the effects of rare air, ceasing to be the monopoly of a few mountaineers, have become the limiting factor of the activities of airmen. In this way the air is now vital to the world system of modern transport. Moreover, within the last decade it has become abundantly apparent that many if not all the symptoms of mountain sickness are simply due to some kind of deficiency of oxygen in the arterial blood—a condition also to be found in many pathological conditions. In such the condition of "unsaturation" of the arterial blood is, however, associated with other troubles. If, therefore, we desire to study the effect of this type of oxygen-want for the purpose of applying the knowledge to general pathology, it is best to study it in its least complicated form—namely, where unsaturation of the blood is simply brought about by insufficient pressure of oxygen in the inspired air.

"Oxygen-Want."

The phrase "oxygen-want" requires a word of caution. Oxygen-want in the body may arise from causes other than insufficient oxygen saturation in the arterial blood. It is not, therefore, a foregone conclusion that information gleaned in the high Alps can be applied to general conditions of oxygen-want. Anoxæmia, which by convention means want of oxygen in the tissues, and not merely as its derivation implies—want of oxygen in the blood—may be divided into three classes [1]: (1) the anoxic type, in which the arterial blood is unsaturated; (2) the anæmic type, in which the amount of hæmoglobin per c.cm. of blood is too small; (3) the stagnant or ischæmic type, in which the blood flow is too slow.

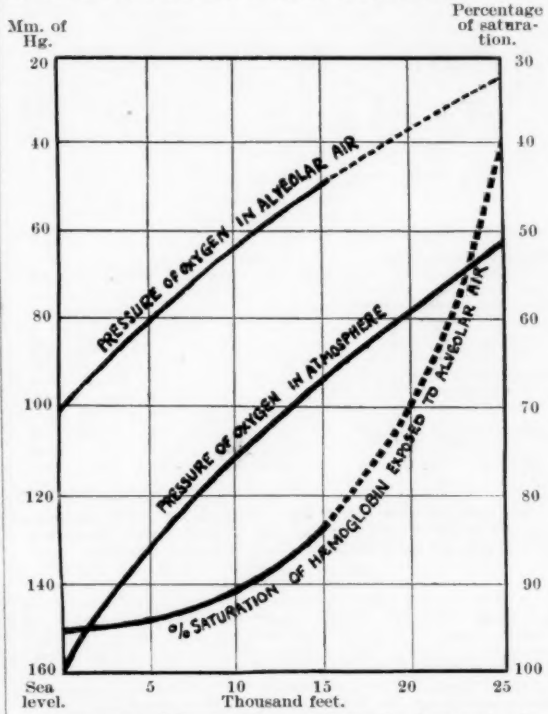
Mountain Sickness.

Mountain sickness is typical of the anoxic type, but not at all typical of the anæmic or of the ischæmic types. Let us pass to the closer study of it. Probably if nine out of every ten persons were asked what they understood by the term "mountain sickness," they would reply that most persons on ascending high mountains, and some on ascending lower ones, vomited. Antiperistalsis is a natural safety valve; but as the study of mountain sickness has proceeded vomiting has held the attention of researchers in a gradually decreasing degree; at present if one were to ask half a dozen physiologists who have worked at over 10,000 feet what they observed, it is probable that not one of the six would mention vomiting as being the first symptom to cross his mind. Yet in point of fact mountaineers who have camped at over 20,000 feet have told me that alimentary trouble is the factor which places the real limit in the altitude attainable. Before discussing the symptoms of mountain sickness in some detail let me first define the cause more particularly than I have yet done.

Cause of Mountain Sickness.

As an ascent is made the barometric pressure gradually diminishes, till at the summer snow line in the Alps (10,000 feet) it is 540 mm., and at the summits of the highest peaks, such as those of Mont Blanc and Monte Rosa (15,000–16,000 feet), the observer is above nearly half the atmosphere and the barometer stands at but 440 mm. As the barometric pressure falls, so in proportion falls the pressure of oxygen which is always approximately one-fifth of the barometric pressure. The figure shows the oxygen pressure in the atmosphere plotted against the altitude in feet. The blood, however, is exposed not directly to the atmosphere, but to the air in the alveoli of the lungs. The composition of this alveolar air cannot be predicted, but measurements have been made up to about 15,000 feet in the Alps with the result shown in the figure. At sea-level, when the atmospheric air forms an oxygen pressure of 160 mm., the oxygen in the alveolar air has a pressure of 100 mm. In other words, the human body, by its configuration, starts with a handicap against it of about 12,000 feet.

To carry the investigation from the alveolar air to the blood which it aerates, one may ask what difference this gradually decreasing-pressure oxygen makes to the blood. That is the kernel of the whole problem of the physiology of alpinism. The lowest line in the figure shows the extent to which the blood would be oxygenated if exposed to the alveolar air of the corresponding altitude at the normal body temperature. At the sea-level 95 per cent. of the hæmoglobin functions and the remaining 5 per cent. leaves the lung without any load of oxygen. As the altitude increases the fall in oxygen pressure produces very little effect upon the amount of oxygen taken up by the arterial blood, but at about 15,000 to 18,000 feet a critical



Percentage of hæmoglobin available for transport of oxygen from the lung if the composition of the alveolar air were as shown.

point is reached, and at altitudes above this the blood ceases to function with increasing rapidity, the line separating the hæmoglobin which does not function from that which does. This constantly, and above 18,000 feet rapidly, rising curve of "unsaturation" of the arterial blood in the physiological mountain which the body has to scale, somewhere on it is the real limit to man's faculties and activities. This curve is the real Everest.

Effects of High Altitudes on the Blood.

Since the blood permeates all the organs of the body the changes which it undergoes may first be studied. Apart altogether from the actual amount of oxygen which the blood carries at any one time, the properties of the fluid as a whole undergo certain well-defined alterations, directed towards the preservation of an approximately constant hydrogen-ion concentration. Our knowledge is limited by the fact that actual measurements of the hydrogen-ion concentration of the blood as it exists in the body have never been made at high altitudes. Hydrogen-ion measurements have been made in chamber experiments both at Copenhagen [2] and on my own blood at Cambridge. [3] These measurements seem to agree in showing that in the chamber there is no change in the reaction of the blood which is large enough to be outside the range of error of the electrode.

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* Being one of a course of advanced lectures in physiology given in the Physiological Laboratory of St. Bartholomew's Hospital, London.

[1] Barcroft: Presidential address, Section I., of British Association, Cardiff, 1920.

[2] Hasselbach and Lindhard: Zur experimentellen Physiologie des Höhenklimas, Biochem. Zeitschr., 1915, lxviii., 295.

[3] T. R. Parsons, W. Parsons, J. Barcroft: Journal of Physiology, 1919, vol. liii., p. 111.

Measurements before incarceration and after six days in my case were for the reduced arterial blood pH = –7·35 and –7·36 respectively. Such constancy of reaction is far from a matter of course. For it is maintained in spite of one factor at all events which would tend to disturb it greatly—namely, a marked fall in the concentration of free carbonic acid in the blood. To compensate for the loss of free CO_2, which would tend to make the blood more alkaline, the kidney secretes alkali and so preserves the balance. In this presentation of the subject I have, as it were, stopped the film to show the most striking picture. The ends of the film are much less definite and extremely difficult of interpretation, especially as regards what is cause and what is effect; for the moment we will leave the matter here.

The constancy in the reaction of the blood seems to carry with it one very important functional property of the blood—namely, a constancy of the power of the hæmoglobin to unite with oxygen. So far then as the resting body at high altitudes is concerned, the blood preserves its normal power of acquiring oxygen in the lung and of giving it over to the tissues.[4] During muscular exercise, however, the reaction of the blood is not constant either at low or on high mountains[3 5 6]. The blood becomes more acid, and in two words the effect of altitude is that a much less amount of exercise will produce the same change in reaction at altitudes than at low, therefore every derangement due to exercise appears with correspondingly greater facility at high altitudes. The following data from a chamber experiment illustrate this point:—

—	In atmospheric air.	In chamber.
Quantity of exercise in 36 mins.	4600 foot pounds.	2700 foot pounds.
Pressure of oxygen—In air	87 mm.	160 mm.
In arterial blood ..	48 mm.	100 mm.
Exponent of hydrogen-ion concentration of blood during rest	7·43	7·44
Ditto at end of exercise	7·35	7·36
Difference	0·08	0·08

Analysis of the blood on Monte Rosa and elsewhere seemed to show that the increase in acid is due principally to the formation of lactic acid by the muscles.

The Heart.

It is notorious that life under anoxæmic conditions puts a strain upon the heart. Any considerable amount of exercise causes evident palpitation, and here I would remind you again that at high altitudes no one does take any considerable quantity of exercise. But even at rest there is usually some quickening of the pulse; not only is this quickening the direct result of oxygen-want, but the suddenness with which it is abolished by administration of oxygen is dramatic. If I may refer again to the experiment in my chamber a year ago, I would draw your attention to an occurrence which illustrates my point. One night, the fourth of my incarceration, I was lying wakefully in bed and counting my pulse from time to time; quite regularly it was within a beat or so of 86. The time was 2 A.M. For a few moments I left the chamber and went into the outer air. In less than a minute it had dropped to 58—a normal figure for me at that time—and even mild exercise on the bicycle ergometer did not greatly raise it. It is evident, therefore, that the heart itself was not in an abnormal state, and—apart from the anoxæmic conditions under which it was working—not unduly irritable.

Let us now turn to consider what the strain on the heart means. How are we to estimate "what the heart is doing"? I use this phrase advisedly, because I wish to avoid the phrase "work done by the heart," which has a definite physiological significance that I do not wish to convey. "The work done by the heart," or at least by the left ventricle, means approximately the volume of blood put out and the mean pressure at which it leaves the ventricle. This may be no indication of the strain put upon the heart. I will give you a case in point.

Just now I have a pupil who suffers from paroxysmal tachycardia.[7] His heart suddenly commences to beat at about 200, and continues so to do for about eight hours. The quantity of blood which leaves the heart drops from 8 to 3 litres per minute, and as the arterial pressure is not greatly altered, the work done by the left ventricle would drop in the same proportion. Yet, of course, it is inconceivable that the man's heart is in reality having a rest. We must seek some other numerical estimate of the strain which the heart is sustaining. In this connexion I would refer you to the work of Rohde.

Rohde,[8] working on the perfused heart, came to the conclusion that the oxygen used by the heart, which may perhaps be taken as a measure of the energy which it is transforming, varied with the product of the pulse-rate × the maximal pressure at each beat. Since Rohde's time the subject has moved rapidly, and all the beautiful work on the metabolism of the heart which we associate with the heart-lung preparation[9] has been carried out. Yet the simplicity of Rohde's result gives it a value which still remains, because the elements from which he builds his measure of "what the heart is doing" are such as can be estimated—the pulse and the systolic pressure. If we apply Rohde's test to the case of paroxysmal tachycardia to which I have referred a result appears quite opposite to that given by conventional measurement of the "work." The pulse in this person, normally 80, with a systolic pressure of 120 mm., rises to 200 with a systolic pressure of 100 mm. Therefore there is reason to suppose that the metabolism of his heart during the attack is increased in some such ratio as 20,000 to 9600, while the amount of blood which it distributes is less than halved.

If we apply the same reasoning to the figures which I gave for my experiment in the chamber, the pulse, as I said, dropped from 86 under anoxæmic conditions to 58 outside the chamber, the arterial pressure was 105 in the chamber, while it normally is 110, so that the limiting figure for the product of the arterial pressure and the pulse was:—

In the chamber in oxygen	86×105=9030
Outside the chamber in 21 per cent. oxygen	58×110=6380

The above figures are, of course, only approximations, because the data used are the mean arterial pressures, and not, as they should be, the systolic pressures. Nevertheless, as approximations they illustrate the point that the heart is doing more than is normally the case during rest.

A natural inquiry arises as to what is driving the heart to its unusual exertions. The answer is, I think, the "nervous system." Dr. W. E. Dixon and I have taken many tracings in years gone by of perfused mammalian hearts which had been excised from the body and to which the supply of oxygen was gradually reduced. In no case did we observe a quickening as the result. Whether the anoxæmia causes a stimulation of the sympathetic or a diminution of the vagus tone, or both, is as yet uncertain. In the absence of any direct proof that the C.N.S. is stimulated by diminished pressure of oxygen in the blood, one rather leans to the idea that the vagus control is to some extent withdrawn. It is natural to see in this increased activity of the heart some sort of compensation to the body for the anoxic condition of the blood. One might suppose that by the supply of an increased volume of blood per minute the body might get the quantity of oxygen which it required, but we have no knowledge that such is the case. So far as man is concerned the data are lacking; such observations as exist were made on the cat by Doi,[10] who found no increase in the volume of blood driven round the body when diminished pressure of oxygen in the inspired air led to a quickening of the pulse.

I have dwelt on the heart at rest because, little as we know about the effect of anoxæmia upon it, that little is at least more than we know about its effect on the heart during exercise. Yet, of course, the fact about the heart which impresses itself upon the mountaineer is not increased pulse-rate at rest, but the increase in the pulse-rate caused by a very trifling degree of exertion. Dr. J. S. Haldane once put this point very pithily to me; he said: "Over 10,000 feet everybody is a case of disordered action of the heart."

In view of the amount of work which has been done within the last five years on disordered action of the heart and on effort syndrome, it is much to be hoped that the investigations of mountain-climbers in this direction may early bear considerable fruit. In the meantime let me pass from the vascular system to its partner in the effort syndrome—the respiratory system. Just as there is usually some quickening of the heart at high altitudes, so there is usually some increase in the total ventilation even at rest.

[4] Barcroft: Teneriffe Expedition, Journal of Physiology, 1912, xlii., p. 44.
[5] Report of Monte Rosa Expedition, 1911, Phil. Trans. B. 206, 49.
[6] Barcroft: The Respiratory Function of the Blood, chapter xviii.
[7] Barcroft, J., Bock, E. N., and Roughton, F. J. W., communicated by Physiological Society, May, 1921, to be published in "Heart."
[8] Rohde: Archiv f. Exp. Path. und Pharm., 1912, Bd. lxviii., p. 401; quoted Respiratory Functions of the Blood, p. 90, et seq.
[9] Starling, H. J., and Colleagues: Journal of Physiology; Evans: Ibid., xlv., p. 230.
[10] Y. Doi: Journal of Physiology, 1921, lv., 43.

Respiration.

More light is necessary on the cause of the mechanism by which the increase in the volume of air which enters and leaves the chest is brought about. There are two theories on the subject, for each of which there is something to be said, and which indeed are not at all mutually destructive. The first is based on two ideas largely accepted as the result of work by Haldane and Priestley,[11] (1) that increased total ventilation is a function of increased hydrogen-ion concentration of the blood; (2) that the increase of hydrogen-ion concentration is necessary to produce a perceptible increase in total ventilation is very slight. The second theory is that the hydrogen-ion concentration of the blood which reaches the respiratory centre is precisely the same at high altitudes as at low ones; but that in view of the fact that the arterial blood contains somewhat less oxygen than usual, the respiratory centre is more active. The actual evidence on which a decision could be based as to which of these two theories is correct is very meagre.

The theoretical questions at issue are: (1) is the hydrogen-ion concentration of the blood altered (with that we have already dealt) and (2) does the degree of anoxæmia experienced in the Alps alter the respiratory rhythm?

The following data may be quoted on this subject from my chamber experiment, some of which have already been discussed. A measured quantity of work was carried out on the bicycle ergometer (*a*) in normal air, (*b*) at the end of six days of progressively anoxæmic conditions; the increase of hydrogen-ion concentration of the blood and the total ventilation were observed.

—	Work performed.	Increased hydrogen-ion concentration of blood.	Increased total ventilation.
Under normal conditions	4600 foot pounds	7·43—7·35 = 0·08	29·2—8·2 = 21 litres.
Under anoxæmic conditions	2700 foot pounds.	7·44—7·36 = 0·08	32·2—6·1 = 26 litres.

The figures show that in each case there was the same increase in hydrogen-ion concentration of the blood and almost the same increase in the total ventilation, so that they afford little help to the theory that the anoxæmic conditions had rendered the centre unduly irritable. On the other hand, they show that this increase in the hydrogen-ion concentration of the blood had under anoxæmic conditions resulted from little more than half the effort that had been required to produce it in atmospheric air. This single experiment, and as far as I know it is the only one available, would appear to favour the idea that the acidæmia factor in effort syndrome is exaggerated at high altitudes, and that there is little change in the irritability of the respiratory centre. While the above experiment gives little support to the theory of increased irritability of the respiratory centre as the result of oxygen-want, it also sheds no light on the alternative theory that the increased ventilation at rest is due to increased hydrogen-ion concentration of the blood. In the experiment in question there was no increase in total ventilation during rest.

Skeletal Muscle.

First, then, let us consider the *musculature*. In connexion with the muscles of the body the effect of oxygen-want, which is to me most interesting at the present time, is not much stressed by climbers—namely, undue stiffness.

It forced itself first upon me, not in the Alps, but in my own respiration chamber, when sojourning there about 15 months ago. It was my custom to pass some portion of the afternoon taking muscular exercise in the form of riding the bicycle ergometer. The result of this exercise was to make me very stiff. Quite recently, however, the same phenomenon occurred in a much more telling way. Three subjects were testing their capacity to do mental work in an atmosphere which was poor in oxygen, to which they were quite unacclimatised. In one case I suggested to Dr. J. P. Lawson, of the Cambridge Psychological Department, who was carrying out the research, that they should undertake physical exercise previous to the mental tests. This they did in the shape of Swedish drill, with the unlooked-for result that they suffered acutely from stiffness, which was very definite for three days, and only disappeared entirely at the end of a week. Dr. Lawson describes the degree of stiffness in his own case as having been exceeded on the previous occasion—namely, when entirely out of training he ran eight miles without a stop on a club run. In control experiment, in which the same drill was undertaken in air after the lapse of about three months, the same subjects experienced in one case no stiffness, in two others stiffness of a quite inferior order. No doubt the less the anoxæmia the greater the amount of exercise which can be taken without subsequently paying the penalty of stiffness. Until trained, muscle, whether because it needs less oxygen or because it is supplied with more, can take almost as much exercise in normal conditions as it is capable of. Such, then, is the subjective effect of oxygen-want on muscular exercise. The principal objective effect which has been discovered is the excessive amount of lactic acid which appears in the blood.[5] The possible relation between the subjective stiffness thus observed, the objective changes in turgidity, and the properties of muscle proteins which are known to occur in muscle when stimulated under grossly anoxæmic conditions form an interesting subject.

Effects of High Altitude upon the Mind.

These effects are perhaps the most interesting of the whole series. It is a wonderful thing to see a man's whole character change as the result of exposure to a certain degree of rarity of the atmosphere, and I am sorry to say this change is always for the worse. Usually some want of restraint occurs which takes different forms in different individuals, the best tempered men may become testy, the most equible may become hilarious. I am sorry to say I have yet to meet the man who becomes pleasanter to live with when he is at 12,000 feet altitude than at the sea-level. These traits may pass into that apathy which is well known to beset climbers, and of which I could give many instances. These traits suggest some sort of intoxication, but such dependence of character on environment brings one into a much wider sphere than that of experimental physiology which limits the scope of this paper.

[11] Haldane and Priestley: Journal of Physiology, 1905, xxxii., p. 225.

NATIONAL CHILDREN ADOPTION ASSOCIATION.

THIS voluntary organisation was founded by Miss Clara Andrew with the primary object of assisting children orphaned or rendered destitute by the war. Its aims were subsequently extended, and now include the formation of a National Register of those who are willing and able to guarantee the future welfare of some needy child, and of a similar register of children accepted by the committee as suitable for adoption. No premiums or weekly payments are allowed to adopters of children, and the interests of both parties are further guaranteed by references, doctors' certificates, and interviews as considered necessary. It is hoped that several hostels will shortly be established in connexion with the association; one hostel at Tower Cressy, Campden Hill, W., has been open since December, 1919, and others have since been opened in London and Southampton. The address of the association is 19, Sloane-street, London, S.W.; subscriptions should be sent to the treasurer, National Children Adoption Association (Francis O. Rybot, Esq.), c/o London Joint City and Midand Bank, 449, Strand, London, W.C. 2.

MALINGERING AND SIMULATION.

IN a paper contributed to the *Military Surgeon* for May Dr. Tom A. Williams deals with Malingering and Simulation of Disease in Warfare, contrasting thetwo extreme views held in the army about malingering: the first that all complaints by the soldier not easily intelligible by the medical officer are feigned and to be punished, the other that all detected simulations are the result of mental abnormality and are to be treated accordingly. His own view is that malingering is the outcome of a selfish desire for greater comfort than the environment supplies, a desire to be fought by moral stimulus, and by the fear of punishment which will make the already uncomfortable environment still more inconvenient. He notes in France and the United States a tendency to relieve simulators of responsibility, but thinks that in England borderland criminals are apt to be punished unless conspicuously insane. Malingering and the exaggeration of symptoms do not occur in simple severe injuries requiring amputations, but in slighter and less definite injuries, especially concussion cases without external wounds; that is why relatives and nurses must be warned not to keep awake the patient's memories of past horrors, nor to dwell on his future uncertainties. The malingerer has really a very bad time; he must be constantly on the alert to see his story is being in no way discredited, and that anxiety wears him down and he loses colour and weight, and people think this proves him ill. Such cases do become nervous and afraid of detection, and are ready to recover if some new and striking treatment gives them an excuse. One patient who had been for eight months a deaf-mute indicated one afternoon that he expected to recover. He went out for a walk, and the evening paper announced he had had a fit in a public place and on coming to himself gave out to his kindly helpers that he had recovered, thank goodness; later he wrote a letter to the doctor, thanking him for saving him from court martial, and promising to do all he could to atone for his conduct.

BRIGHTON AND THE BLIND.

THE Brighton Town Council has just adopted a scheme for the exercise of the powers conferred on the council under the Blind Persons Act, 1920, and has voted a grant of £100 to the local Blind Relief and Visiting Society. The object of the scheme is to keep in touch with babies born blind or with defective sight, and in the case where the home is unsuitable and where the infant shows signs of not developing there is provision for the infant being sent to the National Institute's Home for Blind Babies. Provision is also made for children of school age, for the teaching of basket-making, chair-caning, &c. after school days, and for the marketing of goods.

AN EXAGGERATED REPORT.

OUR Geneva Correspondent writes: Although a good deal of excitement has been aroused over an incident in the surgical clinic here, no rumour current is quite so startling as that found in the English press that "the surgeon . . . extracted the beating heart of a man lying unconscious on the operating-table." The patient in question was a suicide who had inflicted on himself an incised wound. The knife had penetrated the heart and diaphragm. The thorax was opened with the idea of suturing the heart muscle, but the man was already dead. It is said that one of the assistants saw a fibrillation or contraction after adrenalin had been injected into the heart. The fact that the surgeon proceeded to open the abdomen seems to be criticised both on the ground that the patient was dead and therefore that no further procedure was proper in the operating-room, and on the ground that as a contraction of the heart had been seen the patient was not beyond hope of recovery, and therefore exploration of the abdominal cavity was unjustified. A competent commission is investigating these and similar charges and will report in due course In the meantime it should be understood that the dispute is rather on a question of technique than on a question of honour, and that whatever the result of the present inquiry no gross impropriety can be charged to the surgeon.

CONJOINT BOARD OF SCIENTIFIC SOCIETIES.

THE fourth report of this Board shows that scientific investigation is being seriously hampered by the heavy cost involved in the publication of results. An unusually large number of papers are being communicated, including many held up during the war, while the resources of the societies are insufficient at present prices to publish even the normal pre-war number. The country is thus in danger of being handicapped at a time when the rehabilitation of industry is in serious need of scientific assistance. A short abstract of the third report of the Committee on the Water Power of the Empire is included in the report of the Board. It is claimed that too little is being done to ascertain the total resources available, or to secure uniformity in investigation and record. It is urged that steps should be taken to convene an Imperial Water Power Conference in London at which the various Dominions and Dependencies of the Empire should be represented. Such a conference might result in the creation of an Imperial Water Power Board with extensive powers to carry out a comprehensive policy for stimulating, coördinating, and where necessary assisting, development throughout the Empire.

The Conjoint Board of Scientific Societies has also dealt with questions relating to the formation of National Research Committees in connexion with the International Research Council formed in 1919; with the collection of scientific data in the former German Colonies; and with instruction in Technical Optics. The research on glues and other adhesives initiated by the Board as a war measure, at the instance of the Air Ministry, has now been taken over by the Department of Scientific and Industrial Research.

EUGENICS EDUCATION SOCIETY.

IN his address at the annual meeting of the Eugenics Education Society on June 7th Major Leonard Darwin said that eugenics had been called a dismal science, it should rather be described as an untried policy. If combined with an equal striving for improvements in human surroundings, it would more truly justify a hopeful outlook than anything ever yet tried. Both in genetics and eugenics further advances in knowledge are much needed, and many inquiries are now only held up for want of funds. The wisdom of attending to breed in the case of cattle and dogs is universally admitted. Experiences in the stockyard enabled us better to understand the laws of natural inheritance, but reliance on those laws does not imply that the methods of the animal breeder should be introduced into human society. Eugenists advocated nothing which was contrary to the highest religious ideals. They had been accused of wishing to abolish love as a guide to conduct; but this was false. They wished to purify it of all harmful influences. Love was largely aroused by advantageous moral and mental qualities, and it formed the firmest foundation on which to base a eugenic policy. By promoting right ways of regarding sexual problems the moralist was often unknown to himself striving to improve the racial qualities of future generations. We should encourage the discussion of all relevant reforms, but should be cautious in recommending governmental interference. If action be too bold, progress will be slow, for the wrong road will often be taken. If discussion be not bold, progress will also be slow; for a nation cannot grope its way quickly in the darkness of ignorance. As to sterilisation, for example, by open discussion true conclusions would be most likely to be reached. Nearly every subject should be discussed, the occasion being properly chosen. Politicians mainly settle how far the teaching of science is to affect legislation, and this they do largely to catch votes. But the votes of future generations cannot now be caught, and their interests will receive scant attention in all democratic countries. Eugenists should discuss long and freely, and when they do advance, advance boldly. Eugenics aims at increasing the rate of multiplication of stocks above the average, and at decreasing that rate in the case of inferior stocks. Eugenists put moral qualities first, mental second, and physical last. When science taught us that man had been slowly evolved from some ape-like progenitor, it gave rise to a new hope that that upward march would be continued, and out of that hope sprang the eugenic ideal. But science, whilst giving good grounds for hopes, also issued a grave warning concerning the danger of national deterioration from the unchecked multiplication of inferior types. A determination that such a downfall shall not be the fate of our nation if we can help it is a sentiment felt by all of us who are inspired by the eugenic ideal.

SHOT BEFORE BIRTH.

FROM Guatemala, where the use of firearms is more free than in the equable English climate, there comes a curious story of how a baby was shot before birth and probably saved her mother's life at the expense of a slight flesh wound only. Dr. Joaquin Barnoyag, who relates the story[1] was a good deal puzzled by the case. His patient, aged 24, had certainly a small round wound two fingers'-breadth above the umbilicus. But there were no serious symptoms, nor even was there any pain. Although the woman was only eight months pregnant, labour began on the night of her admission into hospital and a healthy girl was born. It was not till two days later that the doctor was asked to see a suppurating fistula on the baby's left buttock. He probed but could find no metal. Clearly the bullet had entered the uterus—but what had happened afterwards? The X rays failed to discover it in mother or child. The mother's clothing showed only one hole. Completely mystified, Dr. Barnoyag asked the mother herself what had happened to the bullet and she at once admitted that she had found one in her bedclothes shortly after the baby was born. If there had been no pregnant uterus to catch the missile no doubt the intestines would have been perforated and the woman would very possibly have died either from hæmorrhage or from peritonitis.

INTRATRACHEAL INSUFFLATION OF CHLOROFORM: A SIMPLE METHOD.

Mr. G. F. V. Anson, M.R.C.S., L.R.C.P. Lond., late senior anæsthetist to the Children's Hospital, Birmingham, and assistant anæsthetist to the General Hospital in that city, who is now on his way to New Zealand, where he intends to continue his studies, writes as follows:—

"I venture to bring to the notice of the medical profession a method of giving an intratracheal insufflation of chloroform vapour. I have used the method a number of times, and have found it eminently satisfactory. The patient is anæsthetised by the usual methods, and an intratracheal catheter is passed through either the mouth or the nose. The catheter is connected by rubber tubing to a mercury safety-valve (such as is fitted to all intratracheal apparatus), and this, in turn, to an oxygen cylinder, from which a slow stream of oxygen is allowed to flow. Into the delivery tube of a Junker apparatus is then fitted a large hypodermic needle of about the bore used with a Barker spinal anæsthetic syringe. This needle is afterwards passed into the lumen of the rubber tube near where it joins the intratracheal catheter. By squeezing the bulb of the Junker apparatus a slow stream of chloroform vapour is allowed to mix with the oxygen. The rate of delivery of the chloroform vapour is curtailed to within safe limits by the bore of the needle.

"The method is of considerable use in such operations as diathermy of growths in the mouth and pharynx where, of course, the use of ether is contra-indicated."

[1] La Juventud Medica, vol. xvii., No. 200, p 205.